

Figure 1A

```

1  gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga
   m d a m k r g l c c v l l l c g

61  gcagtcttcg tttcgcccag cagcgtgagg ccaactgtgc ccgacagaga caatgatgga
   a v f v s p s s a g p t v p d r d n d g

121 atccctgata gtctagaggt tgagggatac acggtagatg tcaagaacaa aaggactttt
   i p d s l e v e g y t v d v k n k r t f

181 ctctcgctt ggatctcaaa tatccatgag aagaaggggc ttaccaagta caagtctctc
   l s p w i s n i h e k k g l t k y k s s

241 cccgagaagt ggtctaccgc ttccgatcca tatagcgatt tcgagaaggt cacaggccgg
   p e k w s t a s d p y s d f e k v t g r

301 atcgataaaa atgtgtctcc agaggctaga cccccctgg tagcagccta cccgattgta
   i d k n v s p e a r h p l v a a y p i v

361 cacgtggaca tggagaacat cattctaagc aaaaacgagg accagtccac acaaaacact
   h v d m e n i i l s k n e d q s t q n t

421 gactccgaga cccgcaccat atctaaaaac accagtactt caaggaccca cacctctgaa
   d s e t r t i s k n t s t s r t h t s e

481 gtgcacggca atgcggaagt ccatgcateg tttttcgata ttggtggctc cgtgtcagcc
   v h g n a e v h a s f f d i g g s v s a

541 ggcttttagca atagcaactc ctgcacgggt gccattgacc actcactgtc attagcaggt
   g f s n s n s s t v a i d h s l s l a g

601 gagaggactt gggctgaaac tatgggtctg aataccgccg ataccgcccg gctcaacgca
   e r t w a e t m g l n t a d t a r l n a

661 aatattcggt acgtcaacac agggactgct cctatatata acgtgctgcc tacgacaagt
   n i r y v n t g t a p i y n v l p t t s

721 cttgtcctgg gcaaaaatca gaccctcgca accattaagg caaaggaaaa tcagctgagc
   l v l g k n q t l a t i k a k e n q l s

781 cagatcctcg cccctaacaa ctattatcca tccaaaaatt tagcccccatt agccctgaac
   q i l a p n n y y p s k n l a p i a l n

841 gcccaggacg acttttctct taccocccata actatgaatt acaatcagtt cctggagctg
   a q d d f s s t p i t m n y n q f l e l

901 gaaaagacga agcagctgag actagacacc gatcaggtgt atggaaacat agcgacatat
   e k t k q l r l d t d q v y g n i a t y

961 aactttgaga acggccgcgt gcgcgtcgac actgggtcaa actggtctga agttctgccg
   n f e n g r v r v d t g s n w s e v l p

1021 caaattcaag agacaaccgc cagaattatc tttaatggga aggacttgaa ccttgtcgaa
   q i q e t t a r i i f n g k d l n l v e

```

Figure 1B

1081 cgtagaattg ccgccgtgaa cccagtgat ccaactcgaga cgactaaacc ggatatgaca  
r r i a a v n p s d p l e t t k p d m t

1141 ctgaaagagg ctctgaagat tgccttcgga ttcaacgaac ctaatggcaa tttgcagtat  
l k e a l k i a f g f n e p n g n l q y

1201 caggggaaag acatcacaga gtttgatttc aatttcgatc agcagacttc ccaaaatatac  
q g k d i t e f d f n f d q q t s q n i

1261 aaaaatcagt tggcagagct gaatgccacc aatatctaca cggttctcga taaaatcaaa  
k n q l a e l n a t n i y t v l d k i k

1321 cttaacgcca agatgaacat attgattcga gacaaacgct tccactacga ccgcaacaat  
l n a k m n i l i r d k r f h y d r n n

1381 atagccgtag gcgctgatga gtctgtcgtc aaggaggctc ataggggaagt tatcaacagc  
i a v g a d e s v v k e a h r e v i n s

1441 agtactgaag ggctgttact taatatcgac aaggacattc ggaagatcct gtccgggtat  
s t e g l l l n i d k d i r k i l s g y

1501 atcgtggaga tcgaggatac cgagggcctg aaggaagtca ttaacgaccg ctatgatatg  
i v e i e d t e g l k e v i n d r y d m

1561 ctgaacattt ccagcttacg acaggacggt aagacattta ttgactttaa aaagtataac  
l n i s s l r q d g k t f i d f k k y n

1621 gacaagctac ccctgtacat ttccaaccca aattacaaag ttaatgtgta tgctgtaacc  
d k l p l y i s n p n y k v n v y a v t

1681 aaggagaaca caatcatcaa tccaagcgag aacggcgata ccagcacaaa tggaatcaaa  
k e n t i i n p s e n g d t s t n g i k

1741 aagatcctta tatttagtaa aaaaggctac gagatcgggt gaggatcc  
k i l i f s k k g y e i g -

Figure 2A

1 gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga gcagtcttcg  
m d a m k r g l c c v l l l c g a v f

71 ttctgcccag cagcgctggg ccaactgtgc ccgacagaga caatgatgga atccctgata gtctagaggt  
v s p s s a g p t v p d r d n d g i p d s l e

141 tgagggatac acggtagatg tcaagaacaa aaggactttt ctctcgccctt ggatctcaaa tatccatgag  
v e g y t v d v k n k r t f l s p w i s n i h e

211 aagaaggggc ttaccaagta caagtcctcc cccgagaagt ggtctaccgc ttccgatcca tatagcgatt  
k k g l t k y k s s p e k w s t a s d p y s d

281 tcgagaaggt cacaggccgg atcgataaaa atgtgtctcc agaggctaga caccctctgg tagcagccta  
f e k v t g r i d k n v s p e a r h p l v a a

351 cccgattgta cacgtggaca tggagaacat cattctaagc aaaaacgagg accagtccac acaaaact  
y p i v h v d m e n i i l s k n e d q s t q n t

421 gactccgaga cccgcaccat atctaaaaac accagtactt caaggaccca cacctctgaa gtgcacggca  
d s e t r t i s k n t s t s r t h t s e v h g

491 atgcggaagt ccatgcatcg gatattggtg gctccgtgtc agccggcttt agcaatagca actcctcgac  
n a e v h a s d i g g s v s a g f s n s n s s

561 ggttgccatt gaccactcac tgtcattagc aggtgagagg acttgggctg aaactatggg tctgaatacc  
t v a i d h s l s l a g e r t w a e t m g l n t

631 gccgatacgg cccggtctca cgcaaatatt cggtagctca acacagggac tgctcctata tataacgtgc  
a d t a r l n a n i r y v n t g t a p i y n v

701 tgcttacgac aagtcttgct ctgggcaaaa atcagaccct cgcaaccatt aaggcaaagg aaaatcagct  
l p t t s l v l g k n q t l a t i k a k e n q

771 gagccagatc ctgcgcccta acaactatta tccatccaaa aatttagccc ccatagccct gaacgcccag  
l s q i l a p n n y y p s k n l a p i a l n a q

841 gacgactttt cctctacccc cataactatg aattacaatc agttcctgga gctggaaaag acgaagcagc  
d d f s s t p i t m n y n q f l e l e k t k q

911 tgagactaga caccgatcag gtgtatggaa acatagcgac atataacttt gagaacggcc gcgtgcgcgt  
l r l d t d q v y g n i a t y n f e n g r v r

981 cgacactggg tcaaactggt ctgaagttct gccgcaaat caagagacaa ccgccagaat tatctttaat  
v d t g s n w s e v l p q i q e t t a r i i f n

1051 gggaaggact tgaaccttgt cgaacgtaga attgccgcgg tgaaccccag tgatccactc gagacgacta  
g k d l n l v e r r i a a v n p s d p l e t t

1121 aaccggatat gacactgaaa gaggctctga agattgcctt cggattcaac gaacctaatg gcaatttgca  
k p d m t l k e a l k i a f g f n e p n g n l

1191 gtatcagggg aaagacatca cagagtttga tttcaatttc gatcagcaga ctcccaaaa tatcaaaaat  
q y q g k d i t e f d f n f d q q t s q n i k n

1261 cagttggcag agctgaatgc caccaatatc tacacggttc tcgataaaat caaacttaac gccaatga  
q l a e l n a t n i y t v l d k i k l n a k m

1331 acatattgat tcgagacaaa cgcttcactc acgaccgcaa caatatagcc gtagggcgctg atgagtctgt  
n i l i r d k r f h y d r n n i a v g a d e s

1401 cgtcaaggag gctcataggg aagttatcaa cagcagtact gaagggtgtg tacttaatat cgacaaggac  
v v k e a h r e v i n s s t e g l l l n i d k d

1471 attcgaaga tcctgtccgg gtatatcggt gagatcgagg ataccgaggg cctgaaggaa gtcattaacg  
i r k i l s g y i v e i e d t e g l k e v i n

Figure 2B

1541 accgctatga tatgctgaac atttccagct tacgacagga cggtaagaca ttatttgact ttaaaaagta  
d r y d m l n i s s l r q d g k t f i d f k k

1611 taacgacaag ctaccctgt acatttccaa cccaaattac aaagttaatg tgtatgctgt aaccaaggag  
y n d k l p l y i s n p n y k v n v y a v t k e

1681 aacacaatca tcaatccaag cgagaacggc gataccagca caaatggaat caaaaagatc cttatatatta  
n t i i n p s e n g d t s t n g i k k i l i f

1751 gtaaaaaagg ctacgagatc ggttgaggat cc  
s k k g y e i g -

Figure 3A

1 gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga  
m d a m k r g l c c v l l l c g

61 gcagtcttcg ttctgcccag cgaagtgaag caagaaaatc gacttctgaa cgagagcgaa  
a v f v s p s e v k q e n r l l n e s e

121 agttcatcac aggttcttct cggatactac ttcatgtact tgaatttcca agcaccaatg  
s s s q g l l g y y f s d l n f q a p m

181 gtggtgacta gtagcaccac cggcgatttg agcattccca gctctgagtt ggagaacatt  
v v t s s t t g d l s i p s s e l e n i

241 cccagcgaaa atcagtactt ccagtctgct atctgggtccg gattcattaa gggtaaaaag  
p s e n q y f q s a i w s g f i k v k k

301 tccgacgaat atacatttgc tacctcggcg gataaaccatg tgacaatgtg ggtggacgac  
s d e y t f a t s a d n h v t m w v d d

361 caggaagtga tcaacaaggc ttcaaactct aataaaatcc ggctcgagaa ggggaggctc  
q e v i n k a s n s n k i r l e k g r l

421 taccagatca aaattcagta ccagcgggaa aaccctacag aaaaaggact cgatttcaag  
y q i k i q y q r e n p t e k g l d f k

481 ctgtactgga cagatagcca aaacaagaaa gaagttatca gctcagacaa tctgcagtta  
l y w t d s q n k k e v i s s d n l q l

541 cccgagctca agcagaagag ttctaataca agcgtctgggc caactgtgcc cgacagagac  
p e l k q k s s n t s a g p t v p d r d

601 aatgatggaa tcctgatag tctagagggt gagggataca cggtagatgt caagaacaaa  
n d g i p d s l e v e g y t v d v k n k

661 aggacttttc tctcgcttgc gatctcaaat atccatgaga agaaggggct taccaagtac  
r t f l s p w i s n i h e k k g l t k y

721 aagtcctccc ccgagaagtg gtctaccgct tccgatccat atagcgattt cgagaaggtc  
k s s p e k w s t a s d p y s d f e k v

781 acaggccgga tcgataaaaa tgtgtctcca gaggctagac acccctggt agcagcctac  
t g r i d k n v s p e a r h p l v a a y

841 ccgattgtac acgtggacat ggagaacatc attctaagca aaaacgagga ccagtccaca  
p i v h v d m e n i i l s k n e d q s t

901 caaaacactg actccgagac ccgcaccata tctaaaaaca ccagtacttc aaggacccac  
q n t d s e t r t i s k n t s t s r t h

961 acctctgaag tgcacggcaa tgcggaagtc catgcatcgt ttttcgatat tgggtggctcc  
t s e v h g n a e v h a s f f d i g g s

1021 gtgtcagccg gcttttagcaa tagcaactcc tcgacggttg ccattgacca ctcactgtca  
v s a g f s n s n s s t v a i d h s l s

Figure 3B

```

1081  ttagcaggtg agaggacttg ggctgaaact atgggtctga ataccgccga tacggcccgg
      l a g e r t w a e t m g l n t a d t a r

1141  ctcaacgcaa atattcggtg cgtcaacaca gggactgctc ctatatataa cgtgctgcct
      l n a n i r y v n t g t a p i y n v l p

1201  acgacaagtc ttgtcctggg caaaaatcag accctcgcaa ccattaaggc aaaggaaaat
      t t s l v l g k n q t l a t i k a k e n

1261  cagctgagcc agatcctcgc ccctaacaac tattatccat ccaaaaattt agcccccata
      q l s q i l a p n n y y p s k n l a p i

1321  gccctgaacg cccaggacga cttttcctct acccccataa ctatgaatta caatcagttc
      a l n a q d d f s s t p i t m n y n q f

1381  ctggagctgg aaaagacgaa gcagctgaga ctagacaccg atcaggtgta tggaacata
      l e l e k t k q l r l d t d q v y g n i

1441  gcgacatata actttgagaa cggccgcgtg cgcgctgaca ctgggtcaaa ctggctctgaa
      a t y n f e n g r v r v d t g s n w s e

1501  gttctgccgc aaattcaaga gacaaccgcc agaattatct ttaatgggaa ggacttgaac
      v l p q i q e t t a r i i f n g k d l n

1561  cttgtcgaac gtagaattgc cgccgtgaac cccagtgatc cactcgagac gactaaaccg
      l v e r r i a a v n p s d p l e t t k p

1621  gatatgacac tgaaagaggc tctgaagatt gccttcggat tcaacgaacc taatggcaat
      d m t l k e a l k i a f g f n e p n g n

1681  ttgcagtatc aggggaaaga catcacagag tttgatttca atttcgatca gcagacttcc
      l q y q g k d i t e f d f n f d q q t s

1741  caaaatatca aaaatcagtt ggcagagctg aatgccacca atatctacac ggttctcgat
      q n i k n q l a e l n a t n i y t v l d

1801  aaaatcaaac ttaacgccaa gatgaacata ttgattcgag acaaacgctt ccactacgac
      k i k l n a k m n i l i r d k r f h y d

1861  cgcaacaata tagccgtagg cgctgatgag tctgtcgtca aggaggctca tagggaagtt
      r n n i a v g a d e s v v k e a h r e v

1921  atcaacagca gtactgaagg gctgttactt aatatcgaca aggacattcg gaagatcctg
      i n s s t e g l l l n i d k d i r k i l

1981  tccgggtata tcgtggagat cgaggatacc gagggcctga aggaagtcac taacgaccgc
      s g y i v e i e d t e g l k e v i n d r

2041  tatgatatgc tgaacatttc cagcttacga caggacggta agacatttat tgactttaaa
      y d m l n i s s l r q d g k t f i d f k

2101  aagtataacg acaagctacc cctgtacatt tccaacccaa attacaaagt taatgtgtat
      k y n d k l p l y i s n p n y k v n v y

```

Figure 3C

```
2161 gctgtaacca aggagaacac aatcatcaat ccaagcgaga acggcgatac cagcacaaat
      a v t k e n t i i n p s e n g d t s t n

2221 ggaatcaaaa agatccttat atttagtaaa aaaggctacg agatcggttg aggatcc
      g i k k i l i f s k k g y e i g -
```

Figure 4A

```

1  gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga
    m d a m k r g l c c v l l l c g

61  gcagtcttcg ttctgcccag cgccggcggg catggggacg ttggcatgca tgtgaaagaa
    a v f v s p s a g g h g d v g m h v k e

121 aaggagaaaa acaaggacga aaacaagcgt aaagacgaag aacgtaataa aacacaggag
    k e k n k d e n k r k d e e r n k t q e

181 gaacacttaa aggagatcat gaagcacata gtaaagattg aggtaaaagg cgaagaggct
    e h l k e i m k h i v k i e v k g e e a

241 gtaaagaagg aggcagcaga aaaactgttg gagaagggtgc cttctgacgt cttagagatg
    v k k e a a e k l l e k v p s d v l e m

301 tataaggcca tcggcggtaa gatctatata gtggacggag acatcactaa acacatatct
    y k a i g g k i y i v d g d i t k h i s

361 ctggaagctc tctccgagga caagaaaaag attaaagaca tctacgggaa ggatgcctta
    l e a l s e d k k k i k d i y g k d a l

421 ttgcacgagc actacgttta cgcaaaggag ggctatgagc ccgtgctcgt tattcagagt
    l h e h y v y a k e g y e p v l v i q s

481 agtgaggact acgtcgagaa taccgagaaa gctctgaatg tgtattacga gatcggaaag
    s e d y v e n t e k a l n v y y e i g k

541 attctgtccc gggacatcct gtccaaaatc aaccagccat accagaaatt ctttgatggt
    i l s r d i l s k i n q p y q k f l d v

601 cttaacacaa tcaaaaacgc gtcagatagc gacgggcagg atcttctgtt tacaaatcaa
    l n t i k n a s d s d g q d l l f t n q

661 ctcaaggaac accccactga tttcagcgtg gagttcctcg agcagaattc taacgaagtc
    l k e h p t d f s v e f l e q n s n e v

721 caggaggtgt tcgccaaggc atttgcgtac tatatcgaac cccagcatcg cgatgtgctc
    q e v f a k a f a y y i e p q h r d v l

781 cagctgtacg ccccgaggc atttaactac atggacaaat tcaatgaaca ggagattaat
    q l y a p e a f n y m d k f n e q e i n

841 ctgtctctgg aggaactgaa agaccagagg atgctctccc ggtatgaaaa gtgggaaaag
    l s l e e l k d q r m l s r y e k w e k

901 atcaaacagc attaccagca ttggtccgac tccctgtcag aagagggggc cggcctgttg
    i k q h y q h w s d s l s e e g r g l l

961 aaaaagttgc agattcccat cgagcctaag aaagatgata taatacactc tctaagccag
    k k l q i p i e p k k d d i i h s l s q

1021 gaggagaagg aactcctgaa gcggatacaa atcgactcat ccgatttcct tagcacagaa
    e e k e l l k r i q i d s s d f l s t e

```



Figure 4B

1081 gagaaggagt ttctaaaaaa acttcagata gatattagag attcactgag cgaggaagag  
e k e f l k k l q i d i r d s l s e e e

1141 aaggagctgc tcaaccgaat tcaagtcgat agttcgaacc ccttgtcaga aaaagagaag  
k e l l n r i q v d s s n p l s e k e k

1201 gaattcctga aaaagttgaa gctcgacatc cagccgtacg atattaatca gcggctacaa  
e f l k k l k l d i q p y d i n q r l q

1261 gacaccggcg gtctgattga tagccccagc atcaaccttg acgtacggaa gcaatataag  
d t g g l i d s p s i n l d v r k q y k

1321 cgcgacattc aaaatatcga cgccctatta catcaatcca taggctccac gctatacaat  
r d i q n i d a l l h q s i g s t l y n

1381 aaaatctatc tatacgaaaa catgaatatt aacaatctca ccgctacact gggagcggac  
k i y l y e n m n i n n l t a t l g a d

1441 ctggtcgata gtacagacaa cacaaagata aacagaggta ttttcaacga attcaaaaaag  
l v d s t d n t k i n r g i f n e f k k

1501 aactttaagt attcgatcag cagtaactat atgattggtg acatcaatga acggcccgcga  
n f k y s i s s n y m i v d i n e r p a

1561 ttagacaatg agagggttgaa gtggagaatt caactgagtc ctgatactag ggccggctat  
l d n e r l k w r i q l s p d t r a g y

1621 ctggagaacg ggaaactgat cttacagcga aacatcgggc tggagatcaa ggatgtgcag  
l e n g k l i l q r n i g l e i k d v q

1681 attatcaagc agagcgaaaa agaatacatt cgcacgcagc ccaaggtggg gcctaagtca  
i i k q s e k e y i r i d a k v v p k s

1741 aagatcgata ccaagatcca ggaagctcag ctcaacatta accaggagtg gaataaagct  
k i d t k i q e a q l n i n q e w n k a

1801 cttggtctgc caaaatacac caaacttatc acctttaatg tgcacaacag gtatgcctct  
l g l p k y t k l i t f n v h n r y a s

1861 aatatcgtcg agtcagcata cctgattctc aatgaatgga agaacaatat tcagtctgac  
n i v e s a y l i l n e w k n n i q s d

1921 ctgatcaaga aggtcacgaa ttatctggtg gacggaaatg gcagattcgt gttcacccgac  
l i k k v t n y l v d g n g r f v f t d

1981 ataactttgc caaacattgc cgagcaatac actcatcagg atgaaattta cgagcaagtc  
i t l p n i a e q y t h q d e i y e q v

2041 cactccaaag gtctgtatgt tccagagtca agatcgattc tgctccatgg tccatccaaa  
h s k g l y v p e s r s i l l h g p s k

2101 ggggttgagc ttcgaaacga ttctgaggga tttatcgctg actttggagc cgctgtggat  
g v e l r n d s e g f i a d f g a a v d

Figure 4C

```
2161  gactacgccg gatacctggt ggataagaat cagtctgac tcgtgacaaa tagcaaaaaa
      d y a g y l l d k n q s d l v t n s k k

2221  ttcataagata ttttcaagga ggaaggaggat aacctgactt cctatggccg cacgaacgag
      f i d i f k e e g s n l t s y g r t n e

2281  gctgaatttt ttgcggaagc ctttagactt atgcacagca ccgaccatgc tgaaagggtg
      a e f f a e a f r l m h s t d h a e r l

2341  aaggtagaaa agaagcccc taaaaccttc cagttcataa atgaccagat caagttcatc
      k v q k n a p k t f q f i n d q i k f i

2401  atcaactctt gaggatcc
      i n s -
```

Figure 5A

1 gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga  
m d a m k r g l c c v l l l c g

61 gcagtcttcg tttcgccag cgccggcggg catggggacg ttggcatgca tgtgaaagaa  
a v f v s p s a g g h g d v g m h v k e

121 aaggagaaaa acaaggacga aaacaagcgt aaagacgaag aacgtaataa aacacaggag  
k e k n k d e n k r k d e e r n k t q e

181 gaacacttaa aggagatcat gaagcacata gtaaagattg aggtaaaagg cgaagaggct  
e h l k e i m k h i v k i e v k g e e a

241 gtaaagaagg aggcagcaga aaaactgttg gagaagggtgc cttctgacgt cttagagatg  
v k k e a a e k l l e k v p s d v l e m

301 tataaggcca tcggcggtaa gatctatatc gtggacggag acatcactaa acacatatct  
y k a i g g k i y i v d g d i t k h i s

361 ctgaagctc tctccgagga caagaaaaag attaaagaca tctacgggaa ggatgcctta  
l e a l s e d k k k i k d i y g k d a l

421 ttgcacgagc actacgttta cgcaaaggag ggctatgagc ccgtgctcgt tattcagagt  
l h e h y v y a k e g y e p v l v i q s

481 agtgaggact acgtcgagaa taccgagaaa gctctgaatg tgtattacga gatcggaaaag  
s e d y v e n t e k a l n v y y e i g k

541 attctgtccc gggacatcct gtccaaaatc aaccagccat accagaaatt ccttgatgtt  
i l s r d i l s k i n q p y q k f l d v

601 cttaacacaa tcaaaaacgc gtcagatagc gacgggcagg atcttctgtt tacaatatca  
l n t i k n a s d s d g q d l l f t n q

661 ctcaaggaac accccactga tttcagcgtg gagttcctcg agcagaattc taacgaagtc  
l k e h p t d f s v e f l e q n s n e v

721 caggaggtgt tcgccaaggc atttgcgtag tatatcgaac cccagcatcg cgatgtgctc  
q e v f a k a f a y y i e p q h r d v l

781 cagctgtacg ccccgagggc atttaactac atggacaaat tcaatgaaca ggagattaat  
q l y a p e a f n y m d k f n e q e i n

841 ctgtctctgg aggaactgaa agaccagagg atgctctccc ggtatgaaaa gtgggaaaaag  
l s l e e l k d q r m l s r y e k w e k

901 atcaaacagc attaccagca ttggtccgac tccctgtcag aagaggggag cggcctgttg  
i k q h y q h w s d s l s e e g r g l l

961 aaaaagttgc agattcccat cgagcctaag aaagatgata taatacactc tctaagccag  
k k l q i p i e p k k d d i i h s l s q

1021 gaggagaagg aactcctgaa gcggatacaa atcgactcat ccgatttcct tagcacagaa  
e e k e l l k r i q i d s s d f l s t e

Figure 5B

1081 gagaaggagt ttctaaaaaa acttcagata gatattagag attcactgag cgaggaagag  
e k e f l k k l q i d i r d s l s e e e

1141 aaggagctgc tcaaccgaat tcaagtcgat agttcgaacc cttgtgcaga aaaagagaag  
k e l l n r i q v d s s n p l s e k e k

1201 gaattcctga aaaagttgaa gctcgacatc cagccgtacg atattaatca gcggctacaa  
e f l k k l k l d i q p y d i n q r l q

1261 gacaccggcg gtctgattga tagccccagc atcaaccttg acgtacggaa gcaatataag  
d t g g l i d s p s i n l d v r k q y k

1321 cgcgacattc aaaatatcga cgccctatta catcaatcca taggctccac gctataacaat  
r d i q n i d a l l h q s i g s t l y n

1381 aaaatctatc tatacgaaaa catgaatatt aacaatctca ccgctacact gggagcggac  
k i y l y e n m n i n n l t a t l g a d

1441 ctggtcgata gtacagacaa cacaaagata aacagaggta ttttcaacga attcaaaaag  
l v d s t d n t k i n r g i f n e f k k

1501 aactttaagt attcgatcag cagtaactat atgattggtg acatcaatga acggccccgca  
n f k y s i s s n y m i v d i n e r p a

1561 ttagacaatg agaggttgaa gtggagaatt caactgagtc ctgatactag ggccggctat  
l d n e r l k w r i q l s p d t r a g y

1621 ctggagaacg ggaaactgat cttacagcga aacatcgggc tggagatcaa ggatgtgcag  
l e n g k l i l q r n i g l e i k d v q

1681 attatcaagc agagcgaaaa agaatacatt cgcacgcagc ccaaggtggt gtagggatcc  
i i k q s e k e y i r i d a k v v -

Figure 6

1 gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga  
m d a m k r g l c c v l l l c g

61 gcagtcttcg tttcgcccag cgccggcggg catggggacg ttggcatgca tgtgaaagaa  
a v f v s p s a g g h g d v g m h v k e

121 aaggagaaaa acaaggacga aaacaagcgt aaagacgaag aacgtaataa aacacaggag  
k e k n k d e n k r k d e e r n k t q e

181 gaacacttaa aggagatcat gaagcacata gtaaagattg aggtaaaagg cgaagaggct  
e h l k e i m k h i v k i e v k g e e a

241 gtaaagaagg aggcagcaga aaaactgttg gagaagggtc cttctgacgt cttagagatg  
v k k e a a e k l l e k v p s d v l e m

301 tataaggcca tcggcggttaa gatctatatc gtggacggag acatcactaa acacatatct  
y k a i g g k i y i v d g d i t k h i s

361 ctggaagctc tctccgagga caagaaaaag attaaagaca tctacgggaa ggatgcctta  
l e a l s e d k k k i k d i y g k d a l

421 ttgcacgagc actacgttta cgcaaaggag ggctatgagc ccgtgctcgt tattcagagt  
l h e h y v y a k e g y e p v l v i q s

481 agtgaggact acgtcgagaa taccgagaaa gctctgaatg tgtattacga gatcggaag  
s e d y v e n t e k a l n v y y e i g k

541 attctgtccc gggacatcct gtccaaaatc aaccagccat accagaaatt ccttgatgtt  
i l s r d i l s k i n q p y q k f l d v

601 cttaacacaa tcaaaaacgc gtcagatagc gacgggcagg atcttctgtt tacaaatcaa  
l n t i k n a s d s d g q d l l f t n q

661 ctcaaggaac accccactga tttcagcgtg gagttcctcg agcagaattc taacgaagtc  
l k e h p t d f s v e f l e q n s n e v

721 caggaggtgt tcgccaaggc attttgagga tcc  
q e v f a k a f -

Figure 7A

1 gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga  
m d a m k r g l c c v l l l c g

61 gcagtcttcg tttcgcccag cagcgctggg ccaactgtgc ccgacagaga caatgatgga  
a v f v s p s s a g p t v p d r d n d g

121 atccctgata gtctagaggt tgagggatac acggtagatg tcaagaacaa aaggactttt  
i p d s l e v e g y t v d v k n k r t f

181 ctctcgcctt ggatctcaaa tatccatgag aagaaggggc ttaccaagta caagtccctc  
l s p w i s n i h e k k g l t k y k s s

241 cccgagaagt ggtctaccgc ttccgatcca tatagcgatt tcgagaaggt cacaggccgg  
p e k w s t a s d p y s d f e k v t g r

301 atcgataaac aggtgtctcc agaggctaga caccctctgg tagcagccta cccgattgta  
i d k q v s p e a r h p l v a a y p i v

361 cacgtggaca tggagaacat cattctaagc aaaaacgagg accagtccac acaaaacact  
h v d m e n i i l s k n e d q s t q n t

421 gactccgaga cccgcaccat atctaacag accagtactt caaggaccca cacctctgaa  
d s e t r t i s k q t s t s r t h t s e

481 gtgcacggca atgcggaagt ccatgcatcg tttttcgata ttggtggctc cgtgtcagcc  
v h g n a e v h a s f f d i g g s v s a

541 ggcttttagca atagccagtc ctcgacgggt gccattgacc actcaactgtc attagcaggt  
g f s n s q s s t v a i d h s l s l a g

601 gagaggactt gggctgaaac tatgggtctg aataccgccg atacggccccg gctcaacgca  
e r t w a e t m g l n t a d t a r l n a

661 aatattcggg acgtcaacac agggactgct cctatatata acgtgctgcc tacgacaagt  
n i r y v n t g t a p i y n v l p t t s

721 cttgtctctg gcaaacagca gaccctcgca accattaagg caaaggaaaa tcagctgagc  
l v l g k q q t l a t i k a k e n q l s

781 cagatcctcg ccctaacaa ctattatcca tccaaaaatt tagcccccat agccctgaac  
q i l a p n n y y p s k n l a p i a l n

841 gcccaggacg acttttcctc tacccccata actatgaatt acaatcagtt cctggagctg  
a q d d f s s t p i t m n y n q f l e l

901 gaaaagacga agcagctgag actagacacc gatcaggtgt atggaaacat agcgacatat  
e k t k q l r l d t d q v y g n i a t y

961 aactttgaga acggccgcgt gcgcgtcgac actgggtcac agtgggtctga agttctgcgc  
n f e n g r v r v d t g s q w s e v l p

1021 caaattcaag agacaaccgc cagaattatc tttaatggga aggacttgaa ccttgtcgaa  
q i q e t t a r i i f n g k d l n l v e

Figure 7B

1081 cgtagaattg ccgccgtgca gccagtgat ccactcgaga cgactaaacc ggatatgaca  
r r i a a v q p s d p l e t t k p d m t

1141 ctgaaagagg ctctgaagat tgccttcgga ttcaacgaac ctaatggcaa tttgcagtat  
l k e a l k i a f g f n e p n g n l q y

1201 caggggaaag acatcacaga gtttgatttc aatttcgata agcagacttc ccaaaatata  
q g k d i t e f d f n f d q q t s q n i

1261 aaaaatcagt tggcagagct gcaggccacc aatatctaca cggttctcga taaaatcaaa  
k n q l a e l q a t n i y t v l d k i k

1321 cttaacgcca agatgaacat attgattcga gacaaacgct tccactacga ccgcaacaat  
l n a k m n i l i r d k r f h y d r n n

1381 atagccgtag gcgctgatga gtctgtcgtc aaggaggctc atagggaagt tatccagagc  
i a v g a d e s v v k e a h r e v i q s

1441 agtactgaag ggctgttact taatatcgac aaggacattc ggaagatcct gtccgggtat  
s t e g l l l n i d k d i r k i l s g y

1501 atcgtggaga tcgaggatac cgagggcctg aaggaagtca ttaacgaccg ctatgatatg  
i v e i e d t e g l k e v i n d r y d m

1561 ctgcagatgt ccagcttacg acaggacggt aagacattta ttgactttaa aaagtataac  
l q i s s l r q d g k t f i d f k k y n

1621 gacaagctac ccctgtacat ttccaacca aattacaaag ttaatgtgta tgctgtaacc  
d k l p l y i s n p n y k v n v y a v t

1681 aaggagaaca caatcatcca gccaaagcgag aacggcgata ccagcacaaa tggaatcaaa  
k e n t i i q p s e n g d t s t n g i k

1741 aagatcctta tatttagtaa aaaaggctac gagatcggtt gaggatcc  
k i l i f s k k g y e i g -

Figure 8A

```

1  gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga
    m d a m k r g l c c v l l l c g

61  gcagtcttcg tttcgcccag cgccggcggg catggggacg ttggcatgca tgtgaaagaa
    a v f v s p s a g g h g d v g m h v k e

121 aaggagaaaa acaaggacga aaacaagcgt aaagacgaag aacgtcagaa aacacaggag
    k e k n k d e n k r k d e e r q k t q e

181 gaacacttaa aggagatcat gaagcacata gtaaagattg aggtaaaagg cgaagaggct
    e h l k e i m k h i v k i e v k g e e a

241 gtaaagaagg aggcagcaga aaaactgttg gagaagggtgc cttctgacgt cttagagatg
    v k k e a a e k l l e k v p s d v l e m

301 tataaggcca tcggcggtaa gatctatata gtggacggag acatcactaa acacatatct
    y k a i g g k i y i v d g d i t k h i s

361 ctogaagctc tctccgagga caagaaaaag attaaagaca tctacgggaa ggatgcctta
    l e a l s e d k k k i k d i y g k d a l

421 ttgcacgagc actacgttta cgcaaaggag ggctatgagc ccgtgctcgt tattcagagt
    l h e h y v y a k e g y e p v l v i q s

481 agtgaggact acgtcgagaa taccgagaaa gctctgaatg tgtattacga gatcggaaaag
    s e d y v e n t e k a l n v y y e i g k

541 attctgtccc gggacatcct gtccaaaatc aaccagccat accagaaatt ccttgatgtt
    i l s r d i l s k i n q p y q k f l d v

601 cttaacacaa tcaaacaggc gtcagatagc gacgggcagg atcttctgtt tacaatatcaa
    l n t i k q a s d s d g q d l l f t n q

661 ctcaaggaac accccactga tttcagcgtg gagttcctcg agcagaattc taacgaagtc
    l k e h p t d f s v e f l e q n s n e v

721 caggaggtgt tcgccaaggc atttgcgtac tatatcgaac ccagcctcgc cgatgtgctc
    q e v f a k a f a y y i e p q h r d v l

781 cagctgtacg ccccgagggc atttaactac atggacaaat tcaatgaaca ggagattcag
    q l y a p e a f n y m d k f n e q e i q

841 ctgtctctgg aggaactgaa agaccagagg atgctctccc ggtatgaaaa gtgggaaaaag
    l s l e e l k d q r m l s r y e k w e k

901 atcaaacagc attaccagca ttggtccgac tccctgtcag aagaggggag cggcctgttg
    i k q h y q h w s d s l s e e g r g l l

961 aaaaagttgc agattcccat cgagcctaag aaagatgata taatacactc tctaagccag
    k k l q i p i e p k k d d i i h s l s q

1021 gaggagaagg aactcctgaa gcggatacaa atcgactcat ccgatttcct tagcacagaa
    e e k e l l k r i q i d s s d f l s t e

```



Figure 8B

1081 gagaaggagt ttctaaaaaa acttcagata gatattagag attcactgag cgaggaagag  
       e k e f l k k l q i d i r d s l s e e e  
 1141 aaggagctgc tcaaccgaat tcaagtcgat agttcgaacc ccttgtcaga aaaagagaag  
       k e l l n r i q v d s s n p l s e k e k  
 1201 gaattcctga aaaagttgaa gctcgacatc cagccgtacg atattaatca ggggctacaa  
       e f l k k l k l d i q p y d i n q r l q  
 1261 gacaccggcg gtctgattga tagccccagc atcaaccttg acgtacggaa gcaatataag  
       d t g g l i d s p s i n l d v r k q y k  
 1321 cgcgacattc aaaatatcga cgccctatta catcaatcca taggctccac gctatacaat  
       r d i q n i d a l l h q s i g s t l y n  
 1381 aaaatctatc tatacgaaaa catgaatatt aaccagctca ccgctacact gggagcggac  
       k i y l y e n m n i n q l t a t l g a d  
 1441 ctggctcgata gtacagacaa cacaaagata aacagaggta ttttcaacga attcaaaaaag  
       l v d s t d n t k i n r g i f n e f k k  
 1501 aactttaagt attcgatcag cagtaactat atgattgttg acatcaatga acggcccgca  
       n f k y s i s s n y m i v d i n e r p a  
 1561 ttagacaatg agagggttgaa gtggagaatt caactgagtc ctgatactag ggccggctat  
       l d n e r l k w r i q l s p d t r a g y  
 1621 ctggagaacg ggaaactgat cttacagcga aacatcgggc tggagatcaa ggatgtgcag  
       l e n g k l i l q r n i g l e i k d v q  
 1681 attatcaagc agagcgaaaa agaatacatt cgcacgcagc ccaagggtggg gcctaagtca  
       i i k q s e k e y i r i d a k v v p k s  
 1741 aagatcgata ccaagatcca ggaagctcag ctcaacatta accaggagtg gaataaagct  
       k i d t k i q e a q l n i n q e w n k a  
 1801 cttggctctgc caaaatacac caaacttctc acctttaatg tgcacaacag gtatgcctct  
       l g l p k y t k l i t f n v h n r y a s  
 1861 aatatcgteg agtcagcata cctgattctc aatgaatgga agaacaatat tcagtctgac  
       n i v e s a y l i l n e w k n n i q s d  
 1921 ctgatcaaga aggtcacgaa ttatctgggtg gacggaaatg gcagattcgt gttcaccgac  
       l i k k v t n y l v d g n g r f v f t d  
 1981 ataactttgc caaacattgc cgagcaatac actcatcagg atgaaattta cgagcaagtc  
       i t l p n i a e q y t h q d e i y e q v  
 2041 cactccaaag gtctgtatgt tccagagtca agatcgattc tgctccatgg tccatccaaa  
       h s k g l y v p e s r s i l l h g p s k  
 2101 gggggttgagc ttcgacagga ttctgaggga tttatcgctg accttgaggc cgctgtggat  
       g v e l r q d s e g f i a d f g a a v d

Figure 8C

```
2161 gactacgccg gatacctggt ggataagcag cagtctgac tcgtgacaaa tagcaaaaaa
      d y a g y l l d k q q s d l v t n s k k

2221 ttcatagata ttttcaagga ggaagggagt cagctgactt cctatggccg cacgaacgag
      f i d i f k e e g s q l t s y g r t n e

2281 gctgaatttt ttgcggaagc ctttagactt atgcacagca ccgaccatgc tgaaagggtg
      a e f f a e a f r l m h s t d h a e r l

2341 aaggtgcaaa agaatgcccc taaaaccttc cagttcataa atgaccagat caagttcatc
      k v q k n a p k t f q f i n d q i k f i

2401 atcaactctt gaggatcc
      i n s -
```

Figure 9A

TPA-Human PA	82	agcgctgggccaactgtgcccacagagacaatgatggaatccctgatagcttagaggttgaggatataca
B.a.- PA	595	.t.....a.t.g.t.a...c.t.....tcat.....a..a....t.
TPA-Human PA	152	cggtagatgtcaagaacaaaaggacttttctctcgcccttgatctcaaataccatgagaagaagggtc
B.a.- PA	665	....t.....a..t.....a.....t..a..a....t..t....t.....a.....a..at.
TPA-Human PA	222	taccaagtacaagtcctccccgagaagtgggtctaccgcttccgatccatatagcgatttcgagaaggtc
B.a.- PA	735	a.....a..t..a..a..t..t..a..a...agc..g.....t....g..c..t.....a.....t
TPA-Human PA	292	acaggccgatcgataaaaatgtgtctccagaggctagacacccctggtagcagcctaccgattgtac
B.a.- PA	805	.....a.....t.....g.....a..a.....a.....t..g.....t..t.....
TPA-Human PA	362	acgtggacatggagaacatcattctaagcaaaaacaggaccagtccacacaaaacactgactccgagac
B.a.- PA	875	.t..a..t.....t..t.....ctca.....t.....t..a.....g..t.....tagt..a..
TPA-Human PA	432	ccgcaccatatctaaaaacaccagtaacttcaaggaccacacctctgaagtgcacggcaatgcggaagtc
B.a.- PA	945	ga.a..a...ag.....t..ttc...aagt.....a..t..tag.....a..t..a.....a.....g
TPA-Human PA	502	catgcatcgtttttcgatattgggtggctccgtgtcagccggctttagcaatagcaactcctcgacggttg
B.a.- PA	1015	.....g.....c..t.....gagt..a..t..a..a.....t..tcg..t..aagt.....c.
TPA-Human PA	572	ccattgaccactcactgtcatttagcaggtgagaggacttgggctgaaactatgggtctgaataccgccga
B.a.- PA	1085	.a.....t..t.....a..tc.....g..a..a.....a.....t..a.....t..
TPA-Human PA	642	tacggcccggtcaacgcaaatattcggtacgtcaacacagggaactgctcctatatataacgtgctgcct
B.a.- PA	1155	...a..aa.at.a..t..c.....a..t..a..t..t....g.....a..c..c.....t..a..a
TPA-Human PA	712	acgacaagtcttgtcctgggcaaaaatcagaccctcgcaaccattaaggcaaggaaaatcagctgagcc
B.a.- PA	1225	.....ttcgt.a..gt.a..a.....a..a.....g..a.....a..t.....c..at.a..t.
TPA-Human PA	782	agatcctcgcccctaacaactattatccatccaaaaatttagcccccatagcctgaacgccaggacga
B.a.- PA	1295	.a..a..t..a.....t..t.....t..t.....c..g..g..a..c..at.a..t..a..a.....
TPA-Human PA	852	cttttctctacccccataactatgaattacaatcagttcctggagctggaaaagacgaagcagctgaga
B.a.- PA	1365	t..cagt.....t..a..t..a.....a..t..t..t..a.....a.....a..at.a...
TPA-Human PA	922	ctagacaccgatcaggtgtatggaaacatagcgacatataactttgagaacggcgcgtgcgcgtcgaca
B.a.- PA	1435	t....t..g.....a..a.....g..t.....a.....c..t.....a..t..aa.a...a.g..g..t.
TPA-Human PA	992	ctgggtcaaactggtctgaagttctgccgcaaattcaagagacaaccgccagaattatctttaatgggaa
B.a.- PA	1505	.a..c..g.....ag.....gt.a.....a.....t..ac..t..c..t.....a..
TPA-Human PA	1062	ggacttgaaccttgtcgaacgtagaattgccgcccgtgaacccagtgatccactcgagacgactaaaccg
B.a.- PA	1575	a..t..a..t..g..a...a.gc.g..a..g..g..t..t..t.....t..a..a.....
TPA-Human PA	1132	gatatgacactgaagaggctctgaagattgccttcggattcaacgaacctaatggcaatttgagtatc
B.a.- PA	1645	.....t..a.....a..c..t..a..a..a..t.....t.....g.....a..c..a..a....
TPA-Human PA	1202	aggggaaagacatcacagagtttgatttcaatttcgatcagcagacttcccaaatatcaaaaatcagtt
B.a.- PA	1715	.a.....a..c..a.....t.....a..a..a..t.....g.....
TPA-Human PA	1272	ggcagagctgaatgccaccaatatctacacggttctcgataaaatcaaacttaacgccaaagatgaacata
B.a.- PA	1785	a..g..at.a..c..a..t..c..a..t..t..at.a.....t..a..t..a..a.....t..t
TPA-Human PA	1342	ttgattcgagacaaacgcttccactacgaccgcaacaatatagccgtaggcgtgatgagtctgtcgtca
B.a.- PA	1855	..a..aa....t.....t..t..t..t..ta.a..t..c.....a..t..g..g.....a..a..t.
TPA-Human PA	1412	aggaggctcataggaagttatcaacagcagtaactgaagggtgttacttaatatcgacaaggacattcg
B.a.- PA	1925	.....a.....a..t..ttcgtca..a..g..at.a..gt.a.....t..t.....t..aa.
TPA-Human PA	1482	gaagatcctgtccgggtatatcgtggagatcgaggataccgagggcctgaaggaagtcattaacgaccgc
B.a.- PA	1995	a..a..at.a..a..t.....t..a..a..t..a.....t..a..g..t..a.....t..a..t..a..a
TPA-Human PA	1552	tatgatatgctgaacatttccagcttacgacaggacggtgaagacatttattgactttaaaaagtataacg
B.a.- PA	2065	.....t....t....t..t.....g..a..t..a..a.....a..t.....a.....t.

Figure 9B

TPA-Human PA	1622	acaagctaccctgtacatttccaacccaaattacaaagttaatgtgtatgctgtaaccaaggagaacac
B.a.- PA	2135	.t..at....gt.a..t..aagt..t..c.....t..g..a.....a.....t..t..a..a.....
TPA-Human PA	1692	aatcatcaatccaagcgagaacggcgataaccagcacaaatggaatcaaaaagatccttatatttagtaaa
B.a.- PA	2205	t..t..t.....t..t.....t..g.....t..t..c..c..g.....g..a..tt.a..c...tc....
TPA-Human PA	1762	aaaggctacgagatcggttga
B.a.- PA	2275	.....t.....a..a.a.

Figure 10A

TPA-human fu	82	gaagtgaagcaagaaaatcgacttctgaacgagagcgaaagttcatcacagggtcttctc
B.a.- PA	88	.....t..a..g..g..c..gt.at.a..t..atca...tcaagt..c.....gt.a..a
TPA-human fu	142	ggatactacttctagtgacttgaatttccaagcaccaatgggtggtgactagtagcaccacc
B.a.- PA	148	.....t..t.....t.....t.....t.....C.....t..ctc.tct..t..a
TPA-human fu	202	ggcgatttgagcattcccagctctgagttggagaacattcccagcgaaaatcagtacttc
B.a.- PA	208	..g.....atct.....t..t.....a..a..t.....atcg.....C..a..t..t
TPA-human fu	262	cagtctgctatctggtccggattcattaaggttaaaaagtcgcgacgaatatacatttgct
B.a.- PA	268	..a.....t.....a.....t..C..a.....g...agt..t.....
TPA-human fu	322	acctcggcggataaccatgtgacaatgtgggtggacgaccaggaagtgatcaacaaggct
B.a.- PA	328	..t..C..t.....t.....a.....a..t.....a.....t..t..a...
TPA-human fu	382	tcaaactctaataaaaatccggctcgagaagggaggctctaccagatcaaaattcagtag
B.a.- PA	388	..t..t.....C.....a.at.a..a..a..a..at.a..t..a..a.....a..t
TPA-human fu	442	cagcgggaaaaccctacagaaaaaggactcgatttcaagctgtactggacagatagccaa
B.a.- PA	448	..a..a.....t.....t.....t.g.....t.....C...tct...
TPA-human fu	502	aacaagaagaagttatcagctcagacaatctgcagttaccgagctcaagcagaagagt
B.a.- PA	508	..t..a.....g..ttctagt..t..ct.a..a..g..a..at.a..a..a..atc.
TPA-human fu	562	tctaa-----tacaagcgctgggccaactgtgcccgcagagacaat
B.a.- PA	568	..g..ctcaagaaaaaagcgaag.....t.....a..t..g..t..a...c.t.....
TPA-human fu	604	gatggaatccctgatagtctagaggttgaggatacacggtagatgtcaagaacaaaagg
B.a.- PA	628	.....tcat.....a..a.....t.....t.....a..t.....a
TPA-human fu	664	acttttctctcgccttgatctcaaatatccatgagaagaaggggcttaccaagtacaag
B.a.- PA	688	.....t..a..a.....t..t.....t.....a.....a..at.a.....a..t..a
TPA-human fu	724	tcctccccgcagaagtggtctaccgcttccgatccatatagcgatttcgagaaggtcaca
B.a.- PA	748	..a..t..t..a..a..a..agc..g.....t.....g..c..t.....a.....t...
TPA-human fu	784	ggccggatcgataaaaatgtgtctccagaggctagacacccctggtagcagcctacccg
B.a.- PA	808	..a.....t.....g.....a..a.....a.....t..g.....t..t...
TPA-human fu	844	attgtacacgtggacatggagaacatcattctaagcaaaaacgaggaccagtcacacaa
B.a.- PA	868	.....t..a..t.....t..t.....ctca.....t.....t..a.....g
TPA-human fu	904	aacactgactccgagaccgcaccatatctaaaaacaccagtaactcaaggaccacacc
B.a.- PA	928	..t.....tagt..a..ga.a..a..a..ag.....t..ttc...aagt.....a..t..t
TPA-human fu	964	tctgaagtgcacggcaatgcggaagtccatgcacgtttttcgatattggtggctccgtg
B.a.- PA	988	ag.....a..t..a.....a.....g.....g.....c..t.....gagt..a
TPA-human fu	1024	tcagccggcttttagcaatagcaactcctcgacgggttgccattgaccactcactgtcatta
B.a.- PA	1048	..t..a..a.....t..tcg..t..aagt.....c..a.....t..t.....a..tc..
TPA-human fu	1084	gcaggtgagaggacttgggctgaaactatgggtctgaataccgccgatacggcccggctc
B.a.- PA	1108	.....g..a..a.....a.....t.a.....t.....a..aa.at.a
TPA-human fu	1144	aacgcaaatattcggtagctcaacacagggactgctcctatatataacgtgctgcctacg
B.a.- PA	1168	..t..c.....a..a..t..a..t..t.....g.....a..c..c.....t..a..a...
TPA-human fu	1204	acaagtcttgtcctgggcaaaaatcagaccctcgcaaccattaaggcaaggaaaatcag
B.a.- PA	1228	..ttcgt.a..gt.a..a.....a..a.....g..a.....a..t.....C..a
TPA-human fu	1264	ctgagccagatcctcgcccctaacaactattatccatccaaaaatttagcccccatagcc
B.a.- PA	1288	t.a..t..a..a..t..a.....t..t.....t..t.....C..g..g..a..c..a
TPA-human fu	1324	ctgaacgccaggacgacttttctctacccccataactatgaattacaatcagttcctg
B.a.- PA	1348	t.a..t..a..a.....t..cagt.....t..a..t..a.....a..t..t

Figure 10B

TPA-human fu	1384	gagctggaaaagacgaagcagctgagactagacaccgatcaggtgtatggaaacatagcg
B.a.- PA	1408	...t.a.....a.....a..at.a...t....t..g.....a..a.....g..t.....a
TPA-human fu	1444	acataataacttttgagaacggccgcgtgcgcgtcgacactgggtcaaactgggtctgaagtt
B.a.- PA	1468	.....c..t.....a..t..aa.a...a.g..g..t..a..c..g.....ag.....g
TPA-human fu	1504	ctgccgcaaattcaagagacaaccgccagaattatctttaatgggaaggacttgaacctt
B.a.- PA	1528	t.a.....a.....t..ac.t..c..t.....a..a..t..a..t..g
TPA-human fu	1564	gtcgaacgtagaattgccgcgtgaaccccagtgatccactcgagacgactaaaccggat
B.a.- PA	1588	..a...a.gc.g..a..g..g..t..t..t.....t.a..a.....
TPA-human fu	1624	atgacactgaaagaggctctgaagattgccttcggattcaacgaacctaattggcaatttg
B.a.- PA	1648	.....t.a.....a..c..t..a..a..a..t.....t.....g.....a..c..a
TPA-human fu	1684	cagtatcaggggaaaagacatcacagagtttgatttcaatttcgatcagcagacttcccaa
B.a.- PA	1708	..a.....a.....a..c..a.....t.....a..a..a..t...
TPA-human fu	1744	aatatcaaaaatcagttggcagagctgaatgccaccaatatctacacggttctcgataaa
B.a.- PA	1768	.....g.....a..g..at.a..c..a..t..c..a..t..t..at.a.....
TPA-human fu	1804	atcaaacttaacgcccaagatgaacatatgtgattcgagacaaacgcttccactacgaccgc
B.a.- PA	1828	.....t.a..t..a..a.....t..t..a..aa.....t.....t..t..t..ta.a
TPA-human fu	1864	aacaatatagccgtaggcgctgatgagtcgtcgtcaaggaggctcatagggaagttatc
B.a.- PA	1888	..t..c.....a..t..g..g.....a..a..t.....a.....a..t
TPA-human fu	1924	aacagcagtactgaagggctgttacttaatatcgacaaggacattcgggaagatcctgtcc
B.a.- PA	1948	..ttcgtca..a..g..at.a..gt.a.....t..t.....t..aa.a..a..at.a..a
TPA-human fu	1984	gggtatatcgtggagatcgaggataccgagggcctgaaggaagtcattaacgaccgctat
B.a.- PA	2008	..t.....t..a..a..t..a.....t..a..g..t..a.....t..a..t..a..a...
TPA-human fu	2044	gatatgctgaacatttccagcttacgacaggacggtaagacatttattgactttaaaaag
B.a.- PA	2068	.....t.....t.....t..t.....g..a..t..a..a.....a..t.....a
TPA-human fu	2104	tataacgacaagctacccctgtacatttccaacccaaattacaaagttaatgtgtatgct
B.a.- PA	2128	.....t..t..at....gt.a..t..aagt..t..c.....t..g..a.....a.....
TPA-human fu	2164	gtaaccaaggagaaacacaatcatcaatccaagcgagaaacggcgataccagcacaaatgga
B.a.- PA	2188	..t..t..a..a.....t..t..t.....t..t.....t..g.....t..t..c..c..g
TPA-human fu	2224	atcaaaaagatccttatatttagtaaaaaaggctacgagatcggttgaggatcc
B.a.- PA	2248	.....g..a..tt.a..c...tc.....t.....a..a..a.-----

Figure 11A

TPA-Human LF	82	gccggcgggcatggggacgttggcatgcatgtgaaagaaaaggagaaaaacaaggacgaa
B.a.- LF	100	..g.....t.....t..t..a..t.....C..a.....g..a.....t..a..t..g
TPA-Human LF	142	aacaagcgtaaagacgaagaacgtaataaaacacaggaggaacacttaaaggagatcatg
B.a.- LF	160	..t...a.a.....t.....a.....a..g..t.....a.....
TPA-Human LF	202	aagcacatagtaaagattgaggtaaaaggcgaagaggctgtaaagaaggaggcagcagaa
B.a.- LF	220	..a.....t.....a..a..a.....g..g..a.....t..a..a.....
TPA-Human LF	262	aaactgttgagaagggtgccttctgacgtcttagagatgtataaggccatcgcggttaag
B.a.- LF	280	..g..ac.t.....a..a..a.....t..t.....a..a..t..a..a...
TPA-Human LF	322	atctatatcgtggacggagacatcactaaacacatatctctcgaagctctctccgaggac
B.a.- LF	340	..a.....t.....t..t..t..a.....t.....t..a.....at..a..t..a..t
TPA-Human LF	382	aagaaaaagattaaagacatctacgggaaggatgccttattgcacgagcactacgtttac
B.a.- LF	400	.....a..a.....t..t.....a.....t.....a..t..a..t..t..a..t
TPA-Human LF	442	gcaaaggagggtatgagcccggtgctgttattcagagtagtgaggactacgtcgagaat
B.a.- LF	460	.....a..a..a.....a.....a..t..a..c..atc.tcg..a..t..t..a..a...
TPA-Human LF	502	accgagaaagctctgaatgtgtattacgagatcggaagattctgtcccgggacatcctg
B.a.- LF	520	..t..a..g..a.....C..t.....t..a..a..t.....at..a..aa.....t..tt.a
TPA-Human LF	562	tccaaaatcaaccagccataccagaaattccttgatgttcttaacacaatcaaaaacgcg
B.a.- LF	580	agt.....t..t..a.....t.....tt..a.....at..a..t..c..t.....t..a
TPA-Human LF	622	tcagatagcgacgggcaggatcttctgtttacaaatcaactcaaggaaacaccccactgat
B.a.- LF	640	..t...tca..t..a..a.....t..a.....t.....g..t.....t.....a..c
TPA-Human LF	682	ttcagcgtggagttcctcgagcagaattctaacgaagtccaggaggtgttcgccaaggca
B.a.- LF	700	..ttct..a..a...t.g..a..a...agc..t..g..a..a..a..a..t..g..a..t
TPA-Human LF	742	tttgctactatatcgaaacccagcatcgcatgtgtctccagctgtacgccccggaggca
B.a.- LF	760	.....a..t.....g..a.....t.....tt..a.....t..t..a.....a..t
TPA-Human LF	802	tttaactacatggacaaattcaatgaacaggagattaatctgtctctggagggaactgaaa
B.a.- LF	820	.....t.....t.....t..c.....a..a..a.....a..ct....a.....t...
TPA-Human LF	862	gaccagaggatgctctcccggatgaaaagtgggaaaagatcaaacagcattaccagcat
B.a.- LF	880	..t..ac.....g..aa..a.....a.....a.....C..t..a..c
TPA-Human LF	922	tgggtccgactccctgtcagaagaggggcgcggcctgttgaaaaagttgcagattcccatc
B.a.- LF	940	...ag...t..tt..a..t.....a..aa..a..a..t..a.....C.....t..t
TPA-Human LF	982	gagcctaagaaagatgatataatacactctctaagccaggaggagaaggaactcctgaag
B.a.- LF	1000	.....a.....c.....t..t..t..tct..a..a..a..a..g..t..a..a
TPA-Human LF	1042	cggatacaaatcgactcatccgatttccttagcacagaagagaaggagtttctaaaaaaa
B.a.- LF	1060	a.a.....t..tagtagt.....tt.atct..t..g..a..a.....t.....g
TPA-Human LF	1102	cttcagatagatattagagattcactgagcgaggaagagaaggagctgctcaaccgaatt
B.a.- LF	1120	..a..a..t.....C..t.....tt.atct..a.....a..a.....tt..a..ta....a
TPA-Human LF	1162	caagtcgatagttcgaacccctgtcagaaaaagagaaggaattcctgaaaaagttgaag
B.a.- LF	1180	..g..g.....agt..t..t..a..t.....a..a..g..tt..a.....c....a
TPA-Human LF	1222	ctcgacatccagccgtacgatattaatcagcggtacaagacacccggcggtctgattgat
B.a.- LF	1240	..t..t..t..a..a..t.....aa..t.g.....t..a..a..gt..a.....
TPA-Human LF	1282	agccccagcatcaaccttgacgtacggaagcaatataagcgcgacattcaaaatatcgac
B.a.- LF	1300	..t..gtca..t..t.....t..a..a.....g.....aa.g..t.....t..t
TPA-Human LF	1342	gccctattacatcaatccataggctccacgtatatacaataaaatctatctatacgaaaac
B.a.- LF	1360	..tt.....t..aagt..ct.g.....t..t.g..t.....t

Figure 11B

TPA-Human LF	1402	atgaatattaacaatctcaccgctacactgggagcggacctggtcgatagtacagacaac
B.a.- LF	1420	.....c..t..c..t..a..a..c..a..t.....tt.a..t...tcc..t..t..t
TPA-Human LF	1462	acaagataaacagaggtattttcaacgaattcaaaaagaactttaagtattcgatcagc
B.a.- LF	1480	..t..a..t..t.....t.....t.....a..t..c..a...agt..ttct
TPA-Human LF	1522	agtaactatatgattgttgacatcaatgaacggcccgcattagacaatgagaggttgaag
B.a.- LF	1540	.....t..a.....a....t.....t.....c.t.....a
TPA-Human LF	1582	tggagaattcaactgagtcctgatactagggccggctatctggagaacgggaaactgac
B.a.- LF	1600	.....c...t.atca..a.....c.a..a..a...t.a..a..t..a..g..t..a
TPA-Human LF	1642	ttacagcgaaacatcgggctggagatcaaggatgtgcagattatcaagcagagcgaaaaa
B.a.- LF	1660	.....aa.....t.....a..a.....a..a..a..t.....atc.....
TPA-Human LF	1702	gaatacattcgcacgcagcccaaggtggtgcctaagtcaaagatcgataccaagatccag
B.a.- LF	1720	.....t..aa.g..t..t..g..a..a.....a...agt..a..a.....a..a..t..a
TPA-Human LF	1762	gaagctcagctcaacattaaccaggagtgaataaagctcttggtctgccaaaatacacc
B.a.- LF	1780	.....a..t..a..t..a..t.....a.....at..a..gt..a.....t..a
TPA-Human LF	1822	aaacttatcacctttaatgtgcacaacaggatgcctctaataatcgtcgagtcagcatac
B.a.- LF	1840	..g.....t..a..c..c.....t..t..a.....a..c.....t..a..aagt..t..t
TPA-Human LF	1882	ctgattctcaatgaatggaagaacaatattcagctcgacctgatcaagaaggtcacgaat
B.a.- LF	1900	t..a..at.g.....a..t.....aag...t..t..a..a.....a..a...
TPA-Human LF	1942	tatctggtggagcgaaatggcagattcgtgttcaccgacataactttgccaaacattgcc
B.a.- LF	1960	..ct.a..t..t..t.....a.....t..t..t.....t..t...c.c..t..t..a..t
TPA-Human LF	2002	gagcaatacactcatcaggatgaaatttacgagcaagtcactccaaaggtctgtatgtt
B.a.- LF	2020	..a.....t..a.....a.....g..a..t.....t..t..a.....gt..a.....
TPA-Human LF	2062	ccagagtcgaagatcgattctgctccatgggtccatccaaaggggttgagcttcgaaacgat
B.a.- LF	2080	.....a..cc..t..t..at..a.....a..t..a.....t..a..at..aa.g..t...
TPA-Human LF	2122	tctgagggatttatcgctgactttggagccgctgtggatgactacgccggatacctgttg
B.a.- LF	2140	ag.....t.....acac..a.....cat.....t..t..t.....t..a..a
TPA-Human LF	2182	gataagaatcagctctgatctcgtgacaaaatagcaaaaaattcatagatattttcaaggag
B.a.- LF	2200	.....c..a.....t..a..t.....tct.....t.....t.....a
TPA-Human LF	2242	gaagggagtaacctgacttccatagccgcacgaacgaggtgaattttttgcggaagcc
B.a.- LF	2260	.....tt.a.....g.....ga..a..a..t..a..g.....a.....
TPA-Human LF	2302	tttagacttatgcacagcaccgaccatgctgaaaggttgaaggtgcaaaagaatgccct
B.a.- LF	2320	.....gt..a.....ttct..g.....c..t..a..a..t.....a.....t..g
TPA-Human LF	2362	aaaaccttcagttcataaatgaccagatcaagttcatcatcaactcttgaggatcc
B.a.- LF	2380	.....t.....a..t..t..c..t.....t.....t..t.....a..a..-----



Figure 12

TPA-Human PA	1	mdamkrglccvlllcgavfvspsagptvpdrndgipdslevegtyvdvknkrtflspw
Sugar minus	1	.....
TPA-Human PA	61	isnihekkgltkyksspekwtasdpysdfekvtgridknvspearhplvaaypivhvdn
Sugar minus	61	.....q.....
TPA-Human PA	121	eniilsknedqstqntdsetrtiskntstsrthtsevhgnaevhasffdiggsvsagfsn
Sugar minus	121	.....q.....
TPA-Human PA	181	snsstvaidhsislagertwaetmglnadtarnaniryvntgtapiynvlpttslvlg
Sugar minus	181	.q.....
TPA-Human PA	241	knqtlatikakenqlsqilapnnyypsknlapialnaqddfsstpitmnynqflelektk
Sugar minus	241	.q.....
TPA-Human PA	301	qlrltdqvygniatynfengrvrvdtgsnwsevlpqiqettariifngkdlnlverria
Sugar minus	301	.....q.....
TPA-Human PA	361	avnpsdplettkpdmtlkealkiafgfnepngnlqyqgkditefdnfdqqtsgniknql
Sugar minus	361	..q.....
TPA-Human PA	421	aelnatniyvtldkiklnakmnilirdkrfhydrnniavgadesvvkeahrevinssteg
Sugar minus	421	...q.....q.....
TPA-Human PA	481	lllnidkdirkilsgyiveiedteglkevindrydmlnisslrqdgktfidfkkyndklp
Sugar minus	481	.....q.....
TPA-Human PA	541	lyisnpykvnyavtkentiinpsengdtstngikkilifskkgyeig
Sugar minus	541	.....q.....

Figure 13

TPA-Human LF	1	mdamkrglccvlllclgavfvspagghgdvgmhvkekeknkdenkrkdeernktqeehlk
Sugar minus	1	.....q.....
TPA-Human LF	61	eimkhivkievkgeeavkkeaekllekvpsdvlemykaiggkiyivdgditkhisleal
Sugar minus	61	.....
TPA-Human LF	121	sedkkkikdiygkdallhehyvyakegyepvlviqssedyventekalnvyveigkilsr
Sugar minus	121	.....
TPA-Human LF	181	dilskinqpyqkfldvltiknasdsdgqdllftnqlkehptdfsveflegnsnevqevf
Sugar minus	181	.....q.....
TPA-Human LF	241	akafayyipqhrdvlqllyapeafnymdkfnegeinlsleelkdqrmisryekwekikqh
Sugar minus	241	.....q.....
TPA-Human LF	301	yqhwsdslseegrgllkklqipiepkddihslsqeekellkriqidssdflsteekf
Sugar minus	301	.....
TPA-Human LF	361	lklqidirdslseeekellnriqvdsnpksekekeflklklldiqpydinqlqdtgg
Sugar minus	361	.....
TPA-Human LF	421	lidspsinldvrkqykrdignidallhqsigstlynkiylyenmninnltatlgadlvds
Sugar minus	421	.....q.....
TPA-Human LF	481	tdntkinrgifnefkknfkysissnymivdinerpaldnerlkwriqlspdtragyleng
Sugar minus	481	.....
TPA-Human LF	541	klilqrnigleikdvqiikqsekeyiridakvvpkskidtkiqaqlningewnkalgpl
Sugar minus	541	.....
TPA-Human LF	601	kytklitfnvhnryasnivesaylilnewknniqsdlikkvtnylvdgngrfvftditlp
Sugar minus	601	.....
TPA-Human LF	661	niaeqythqdeieyevhskglyvpesrsillhgpskgvelrndsegfiadfgaavddyag
Sugar minus	661	.....q.....
TPA-Human LF	721	ylldknqsdldvtnskkfidiqkeegsnltsygrtneaeffaeafmlhstdhaerlkvqk
Sugar minus	721	.....q.....q.....
TPA-Human LF	781	napktfqfindqikfiins
Sugar minus	781	.....

Figure 14

```

1  gatatcgcca ccatggatgc aatgaagaga gggctctgct gtgtgctgct gctgtgtgga
    m d a m k r g l c c v l l l c g

61  gcagtcttcg tttcgcccag cgccggcggg catggggacg ttggcatgca tgtgaaagaa
    a v f v s p s a g g h g d v g m h v k e

121 aaggagaaaa acaaggacga aaacaagcgt aaagacgaag aacgtaataa aacacaggag
    k e k n k d e n k r k d e e r n k t q e

181 gaacacttaa aggagatcat gaagcacata gtaaagattg aggtaaaagg cgaagaggct
    e h l k e i m k h i v k i e v k g e e a

241 gtaaagaagg aggcagcaga aaaactgttg gagaagggtgc cttctgacgt cttagagatg
    v k k e a a e k l l e k v p s d v l e m

301 tataaggcca tcggcggtaa gatctatatc gtggacggag acatcactaa acacatatct
    y k a i g g k i y i v d g d i t k h i s

361 ctcgaagctc tctccgagga caagaaaaag attaaagaca tctacgggaa ggatgcctta
    l e a l s e d k k k i k d i y g k d a l

421 ttgcacgagc actacgttta cgcaaaggag ggctatgagc ccgtgctcgt tattcagagt
    l h e h y v y a k e g y e p v l v i q s

481 agtgaggact acgtcgagaa taccgagaaa gctctgaatg tgtattacga gatcggaaag
    s e d y v e n t e k a l n v y y e i g k

541 attctgtccc gggacatcct gtccaaaatc aaccagccat accagaaatt ccttgatgtt
    i l s r d i l s k i n q p y q k f l d v

601 cttaacacaa tcaaaaacgc gtcagatagc gacgggcagg atcttctgtt taaaaatcaa
    l n t i k n a s d s d g q d l l f t n q

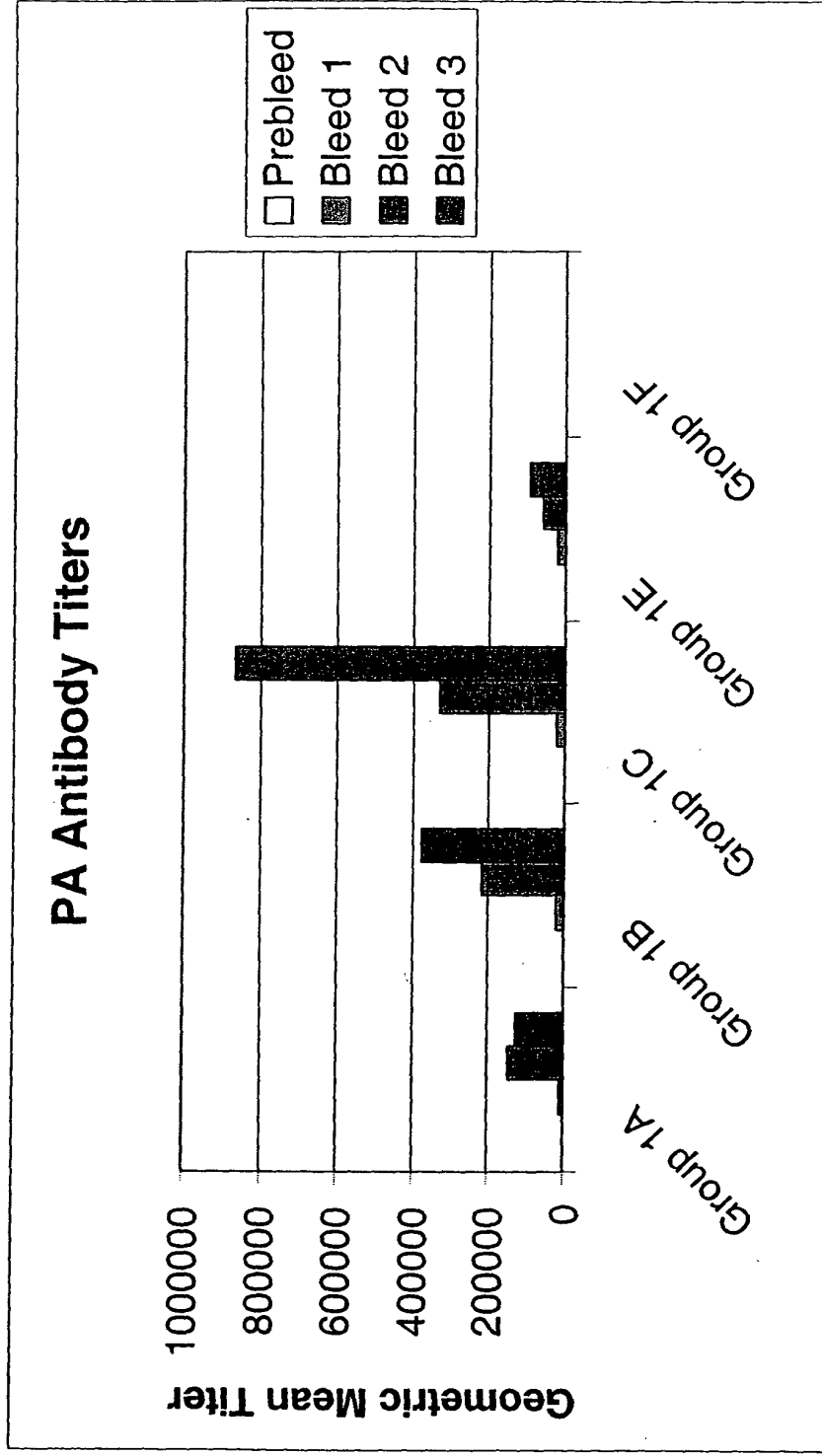
661 ctcaaggaac accccactga tttcagcgtg gagttcctcg agcagaattc taacgaagtc
    l k e h p t d f s v e f l e q n s n e v

721 caggaggtgt tcgccaaggc atttgcgtac tatatcgaac cccagcateg cgatgtgctc
    q e v f a k a f a y y i e p q h r d v l

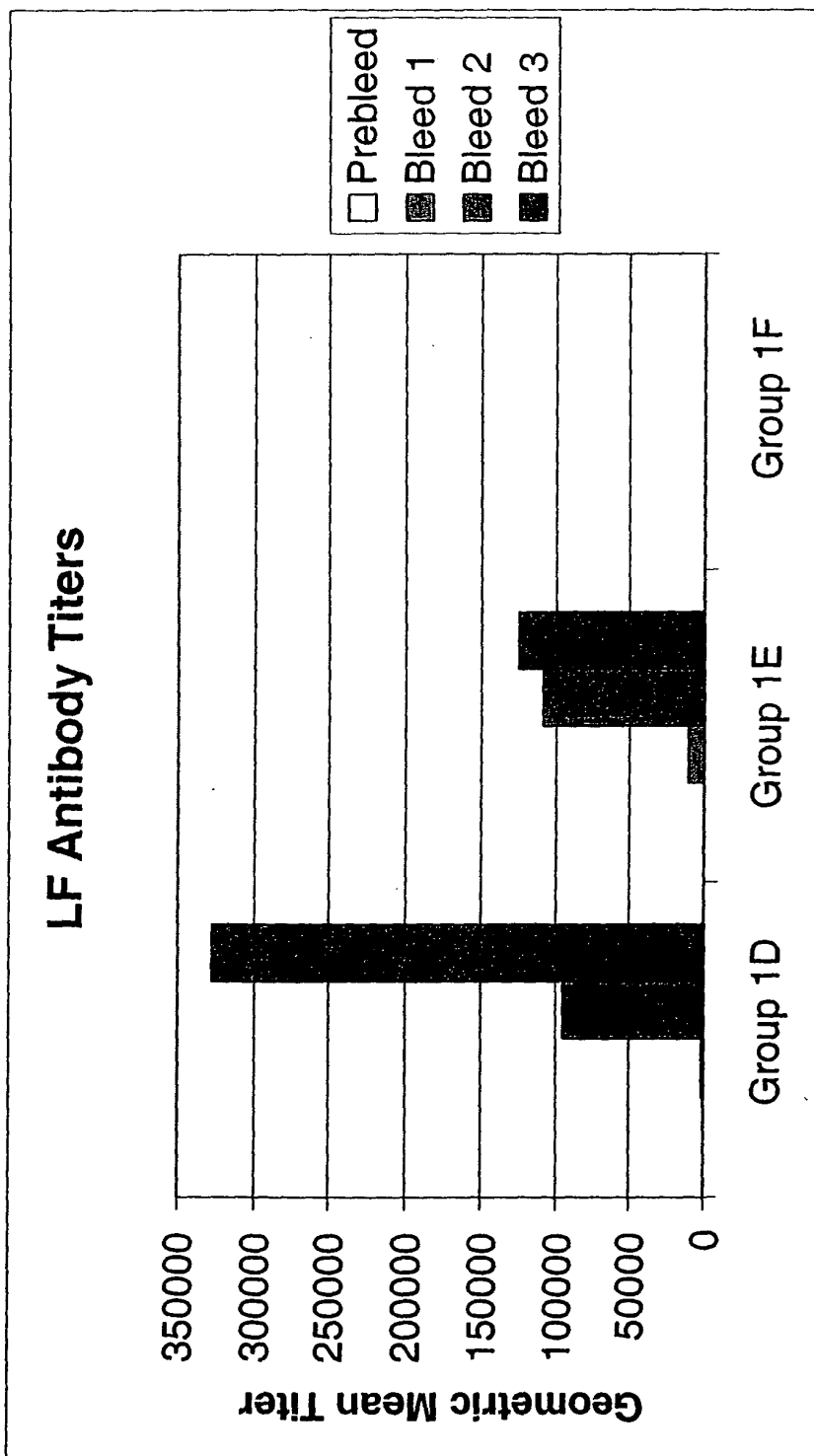
781 cagctgtacg ccccgagggc atttaactac atggacaaat tcaatgaaca ggagattaat
    q l y a p e a f n y m d k f n e q e i n

841 ctgtctctgg aggaactgaa agaccagtga ggatcc
    l s l e e l k d q -

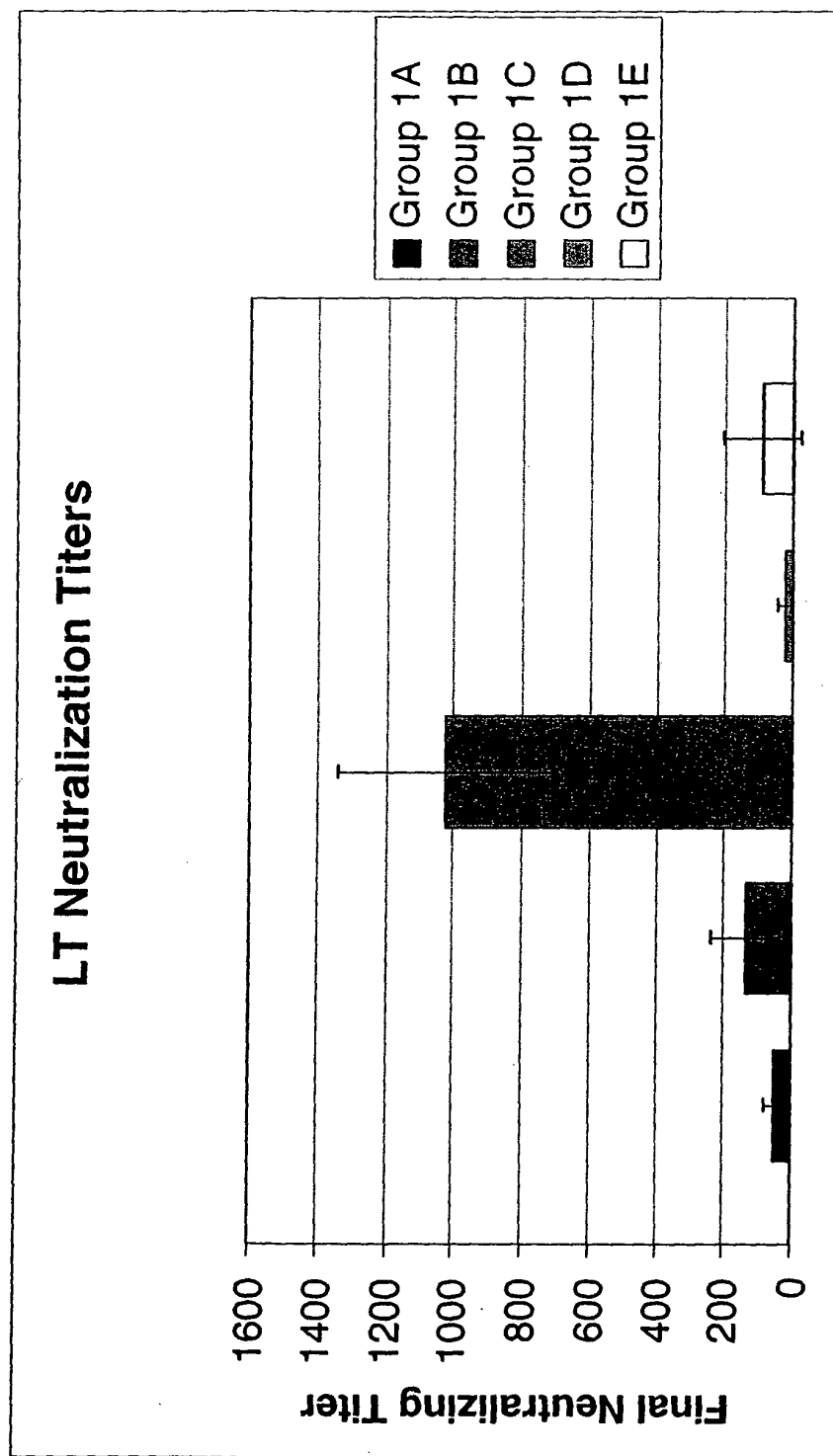
```



**FIG. 15A**



**FIG. 15B**



**FIG. 15C**

## PA Antibody Titers

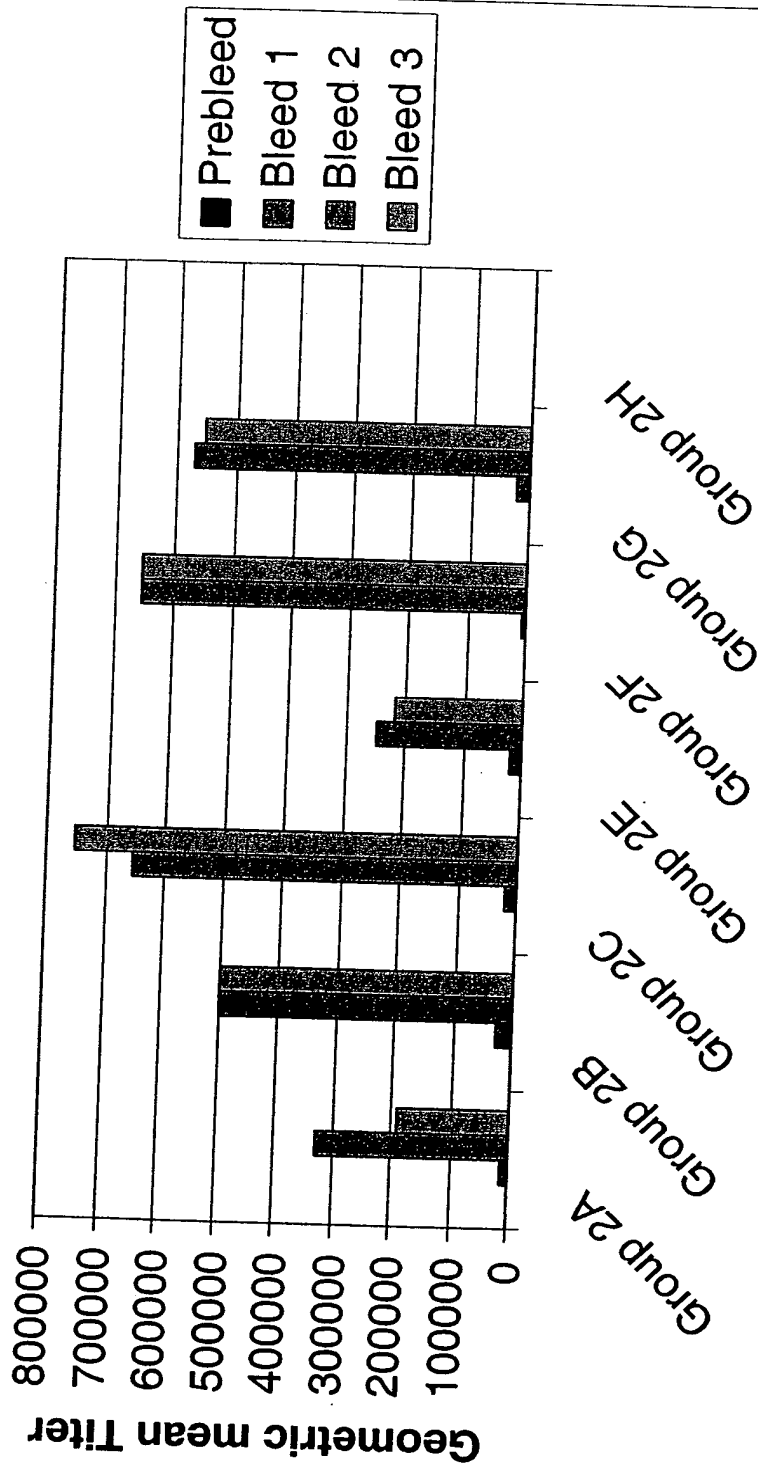
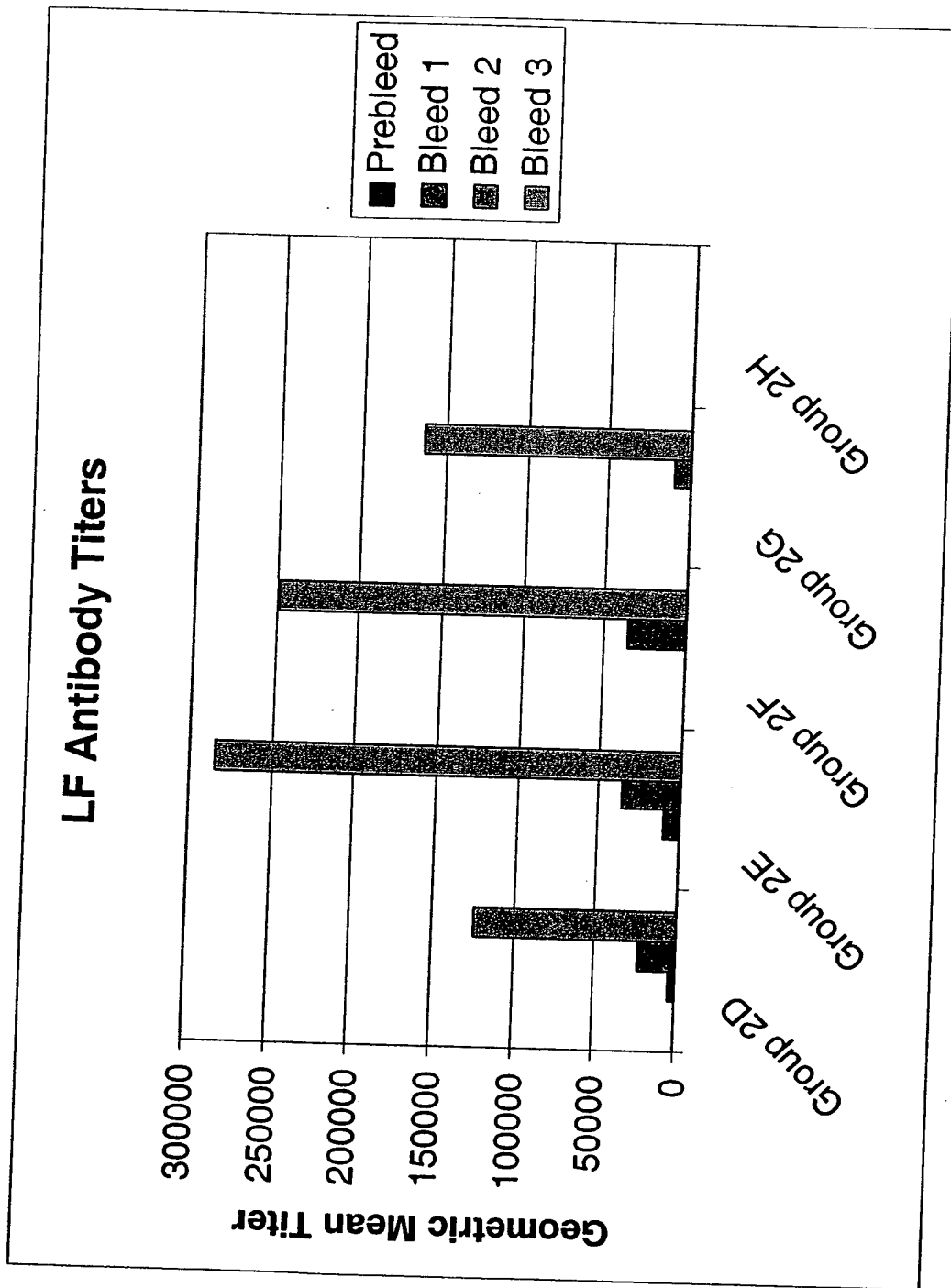
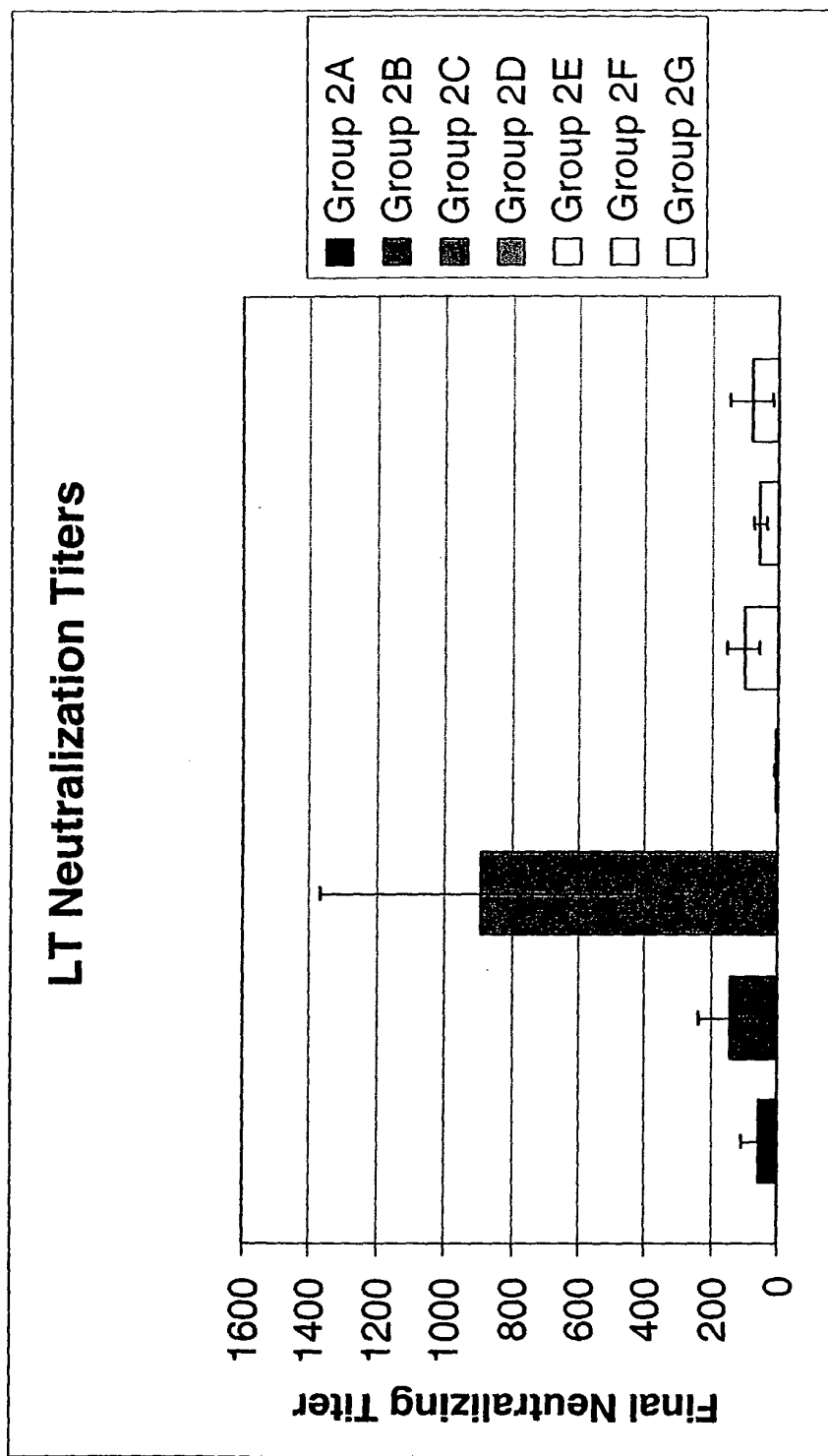


FIG. 16A

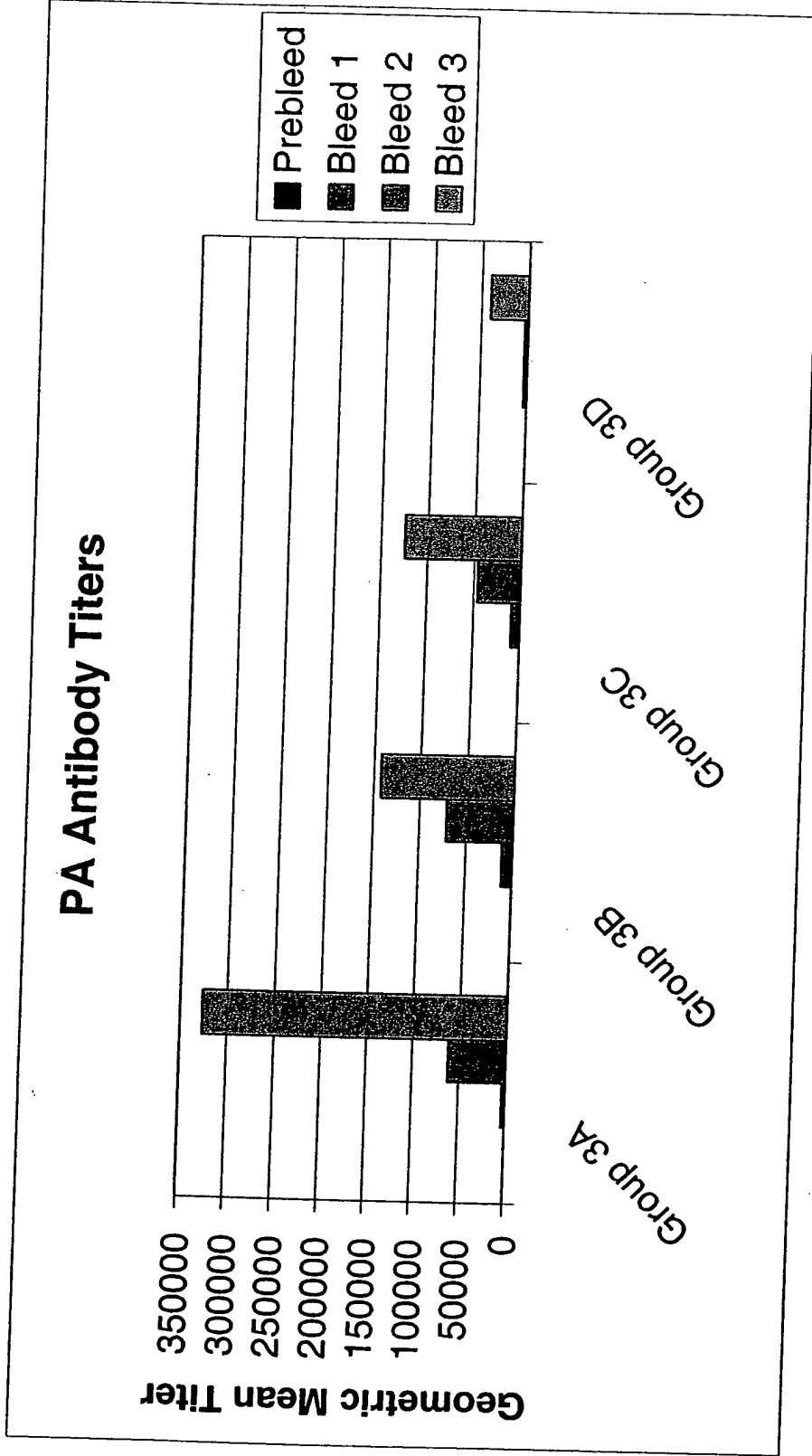


**FIG. 16B**

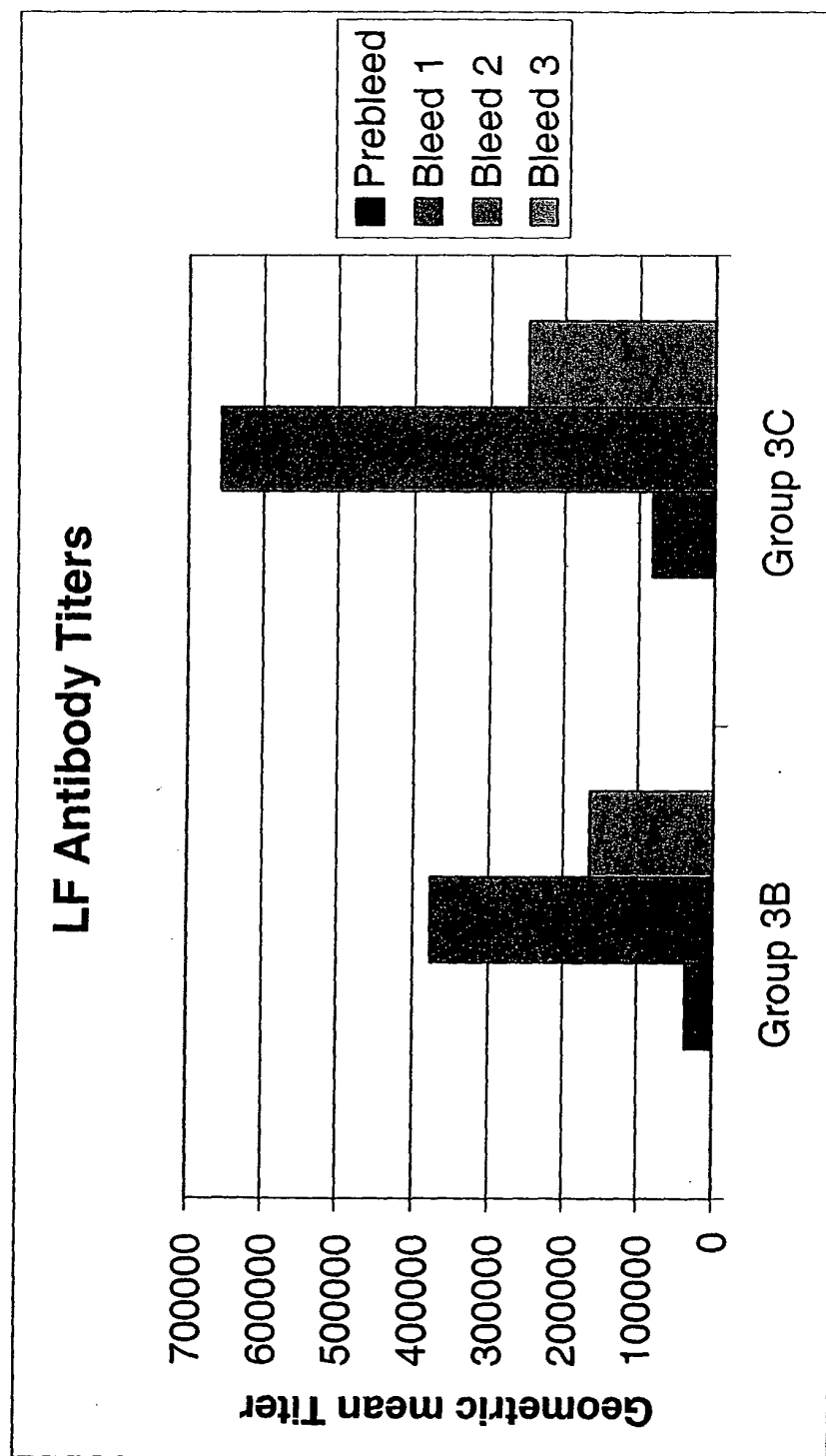




**FIG. 16C**



**FIG. 17A**



**FIG. 17B**

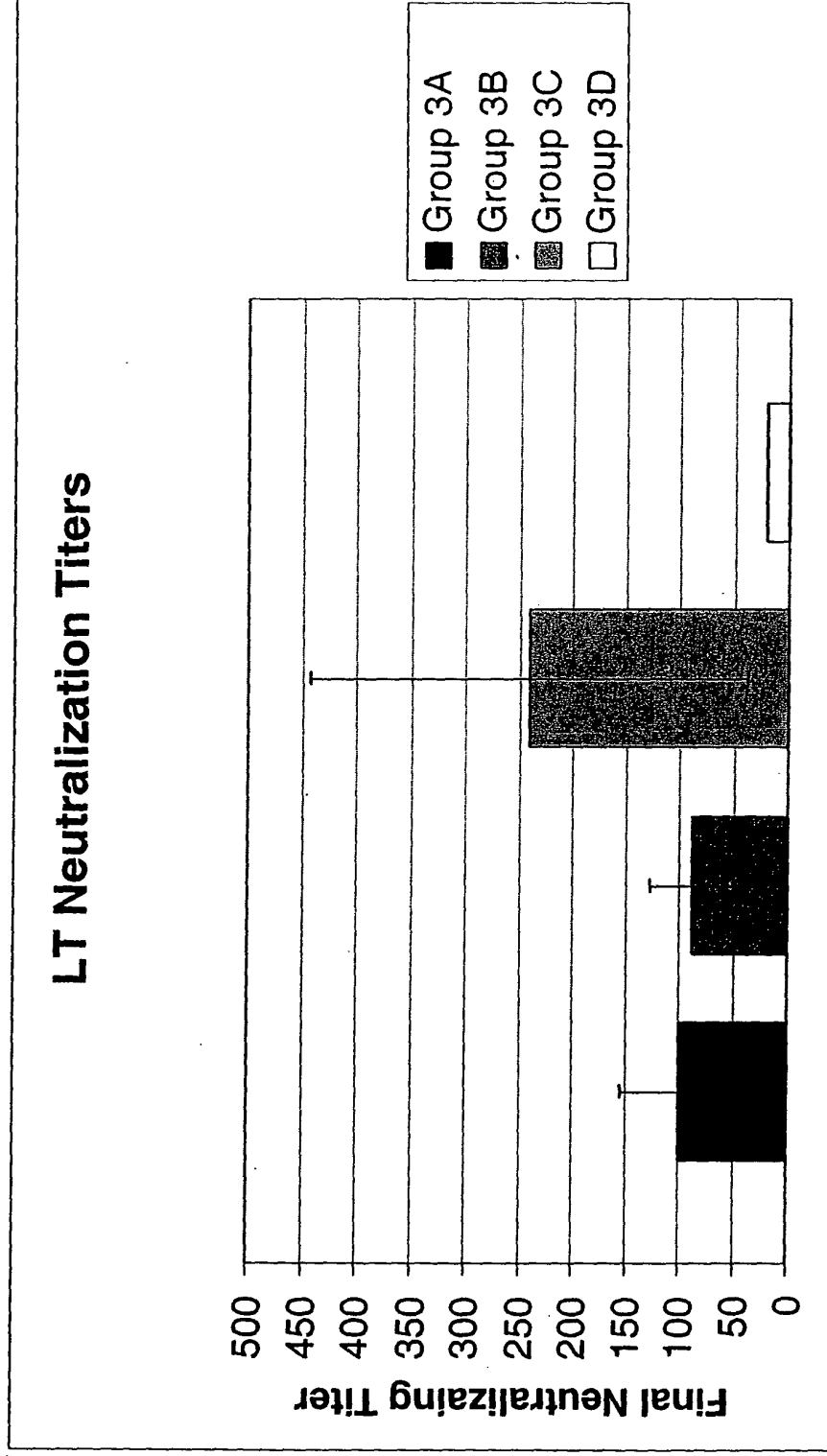


FIG. 17C

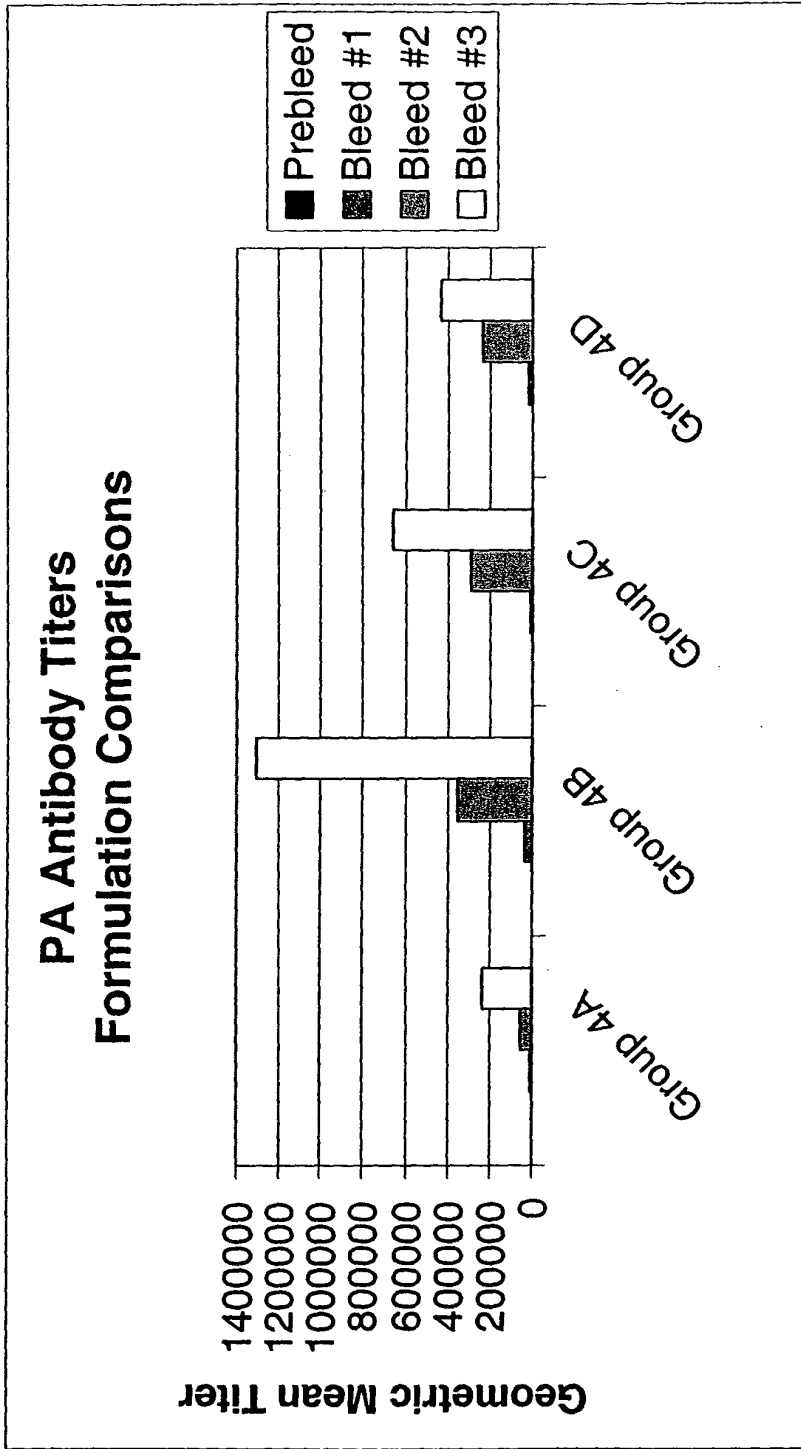
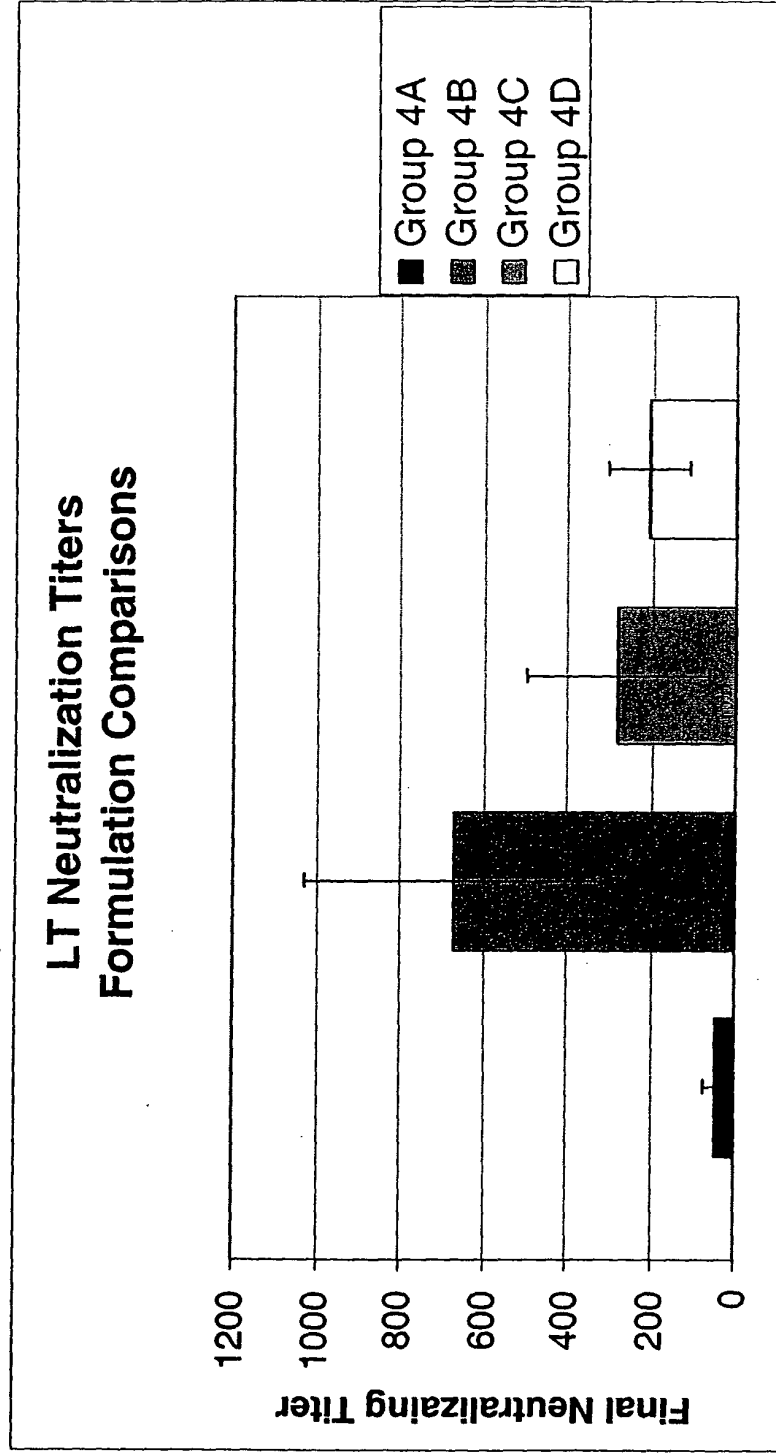
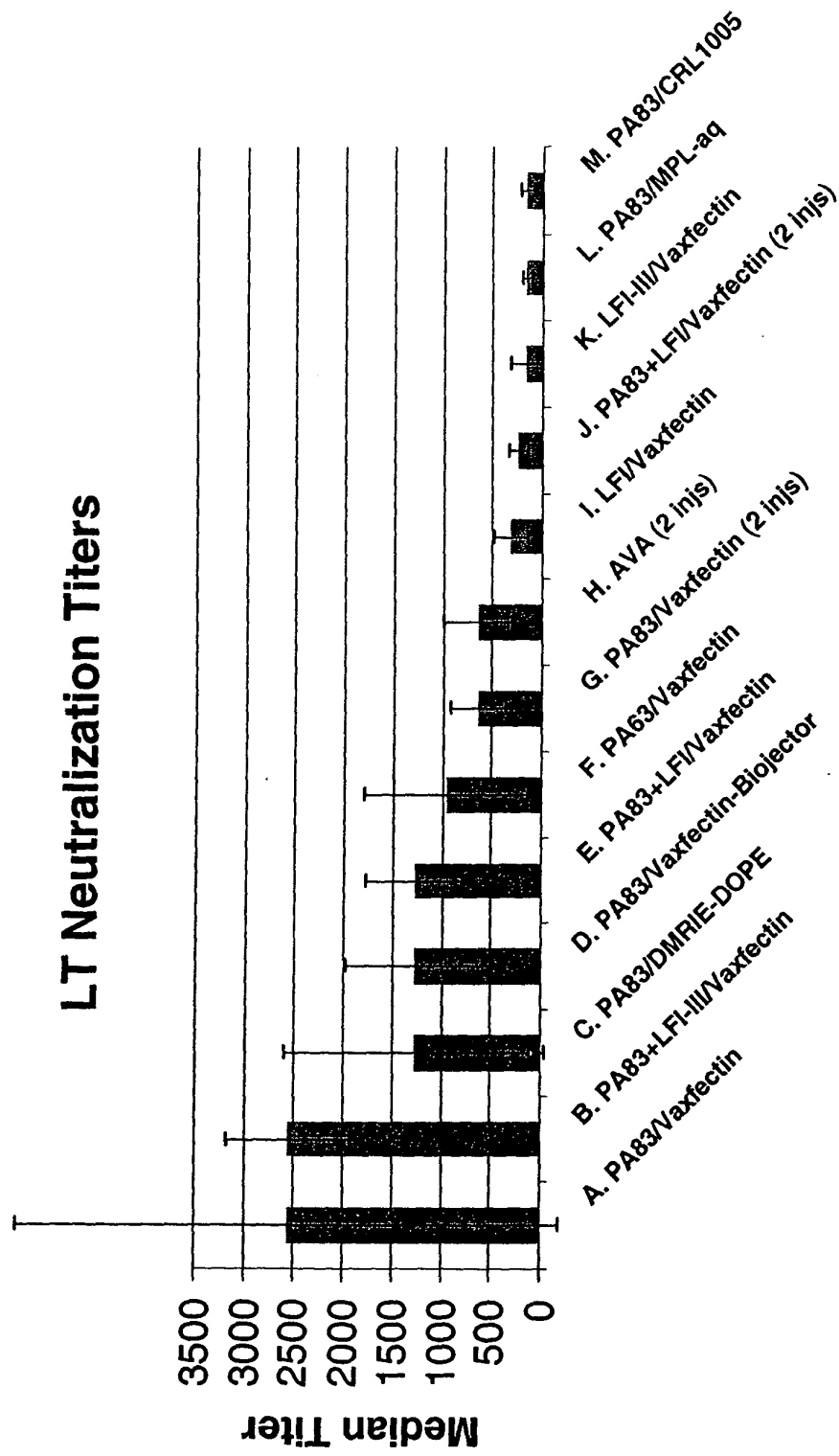


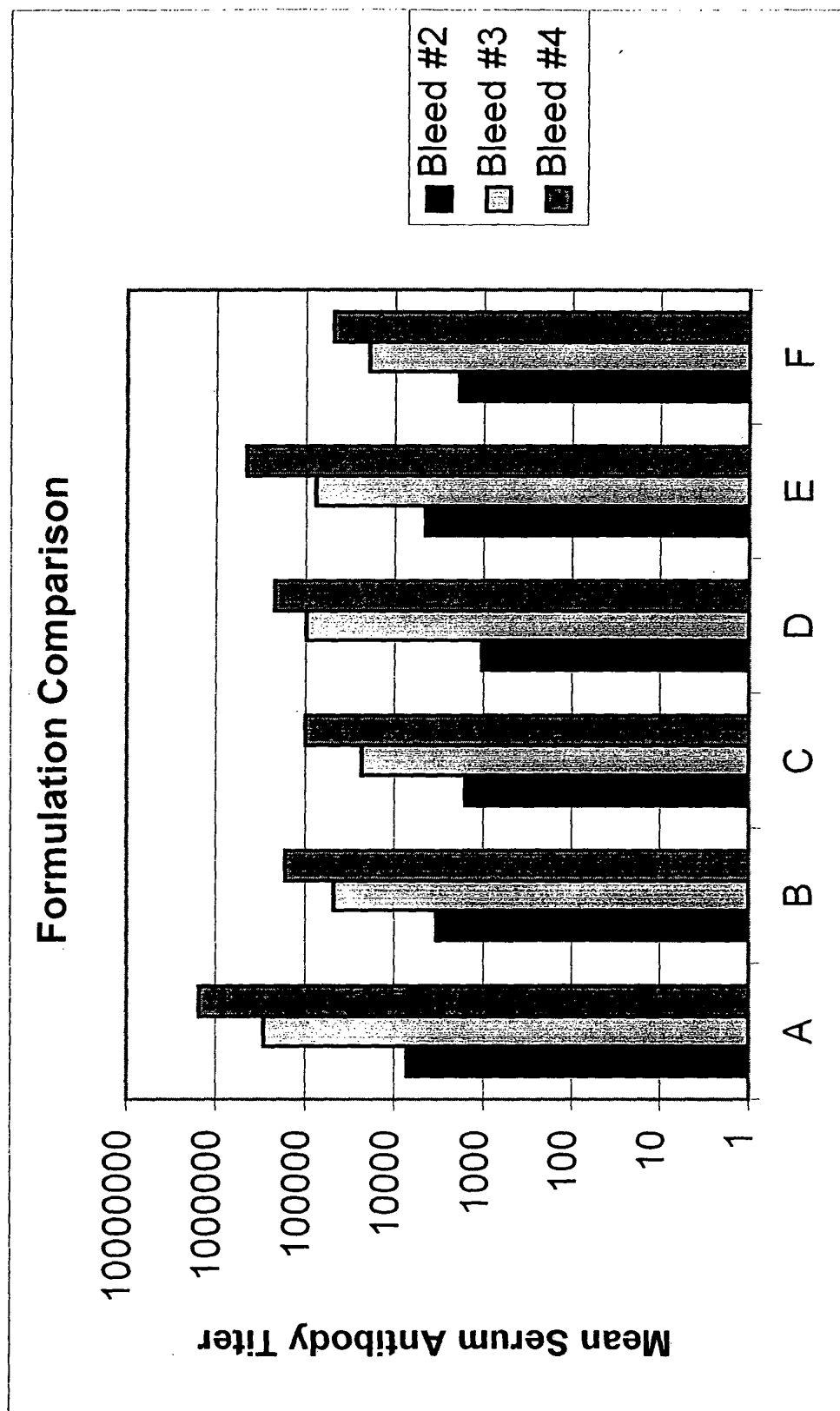
FIG. 18A



**FIG. 18B**



**FIG. 19**



**FIGURE 20**



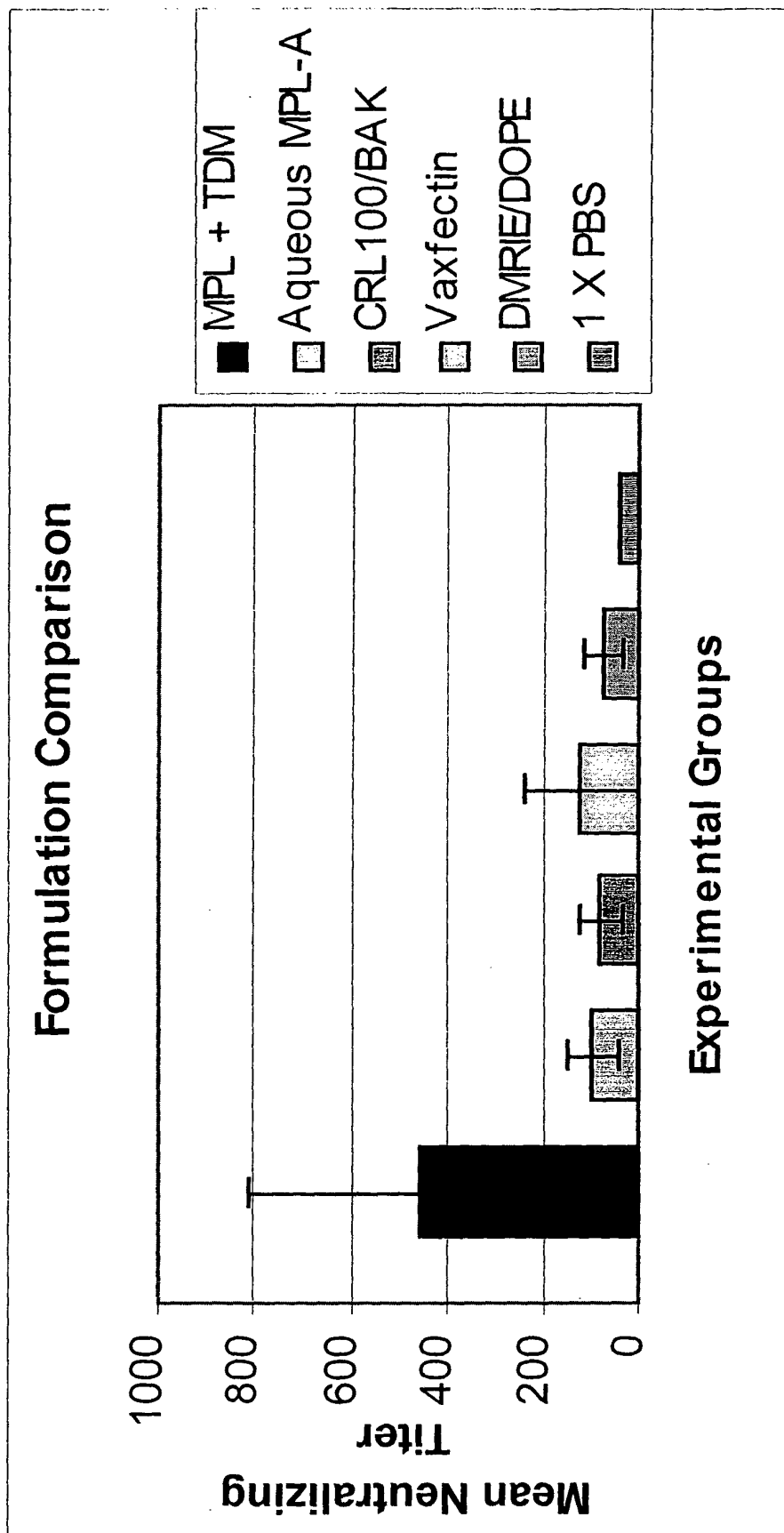


FIGURE 21